ATLAS
OF
INTRACRANIAL TUMORS

U.S. ARMY MEDICAL MUSEUM

1942

BIBLIOGRAPHY

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CONTENTS

This loan set of central-nervous-system tumors was prepared at the Army Medical Museum by William W. Hurteau, Captain, Medical Corps, U.S.A. Dr. Walter Freeman's criticisms and suggestions have enhanced its value, and the generosity of Drs. Eisenhardt and Penfield in supplying cases has been a great help.

J. E. Ash
Colonel, Medical Corps, USA
Curator

HISTOGENESIS

"This plate presents in diagrammatic form the histogenesis of the central nervous system, accurate knowledge of which constitutes the essential background for a clear understanding of the tumors of the brain substance, known in general as gliomas. Unfortunately, knowledge of the development of the brain is incomplete, and the details of this development vary in different parts of the nervous system, so that the diagram is partly hypothetic.

Especially hypothetic are the medulloblasts, described by Schaper under the apt term of "indifferenten Zellen", for they do not have morphologic characteristics by which they may be identified. Yet the hypothesis of their existence seems to be necessary to explain the histogenesis of the nervous system, its malformations and its tumors.

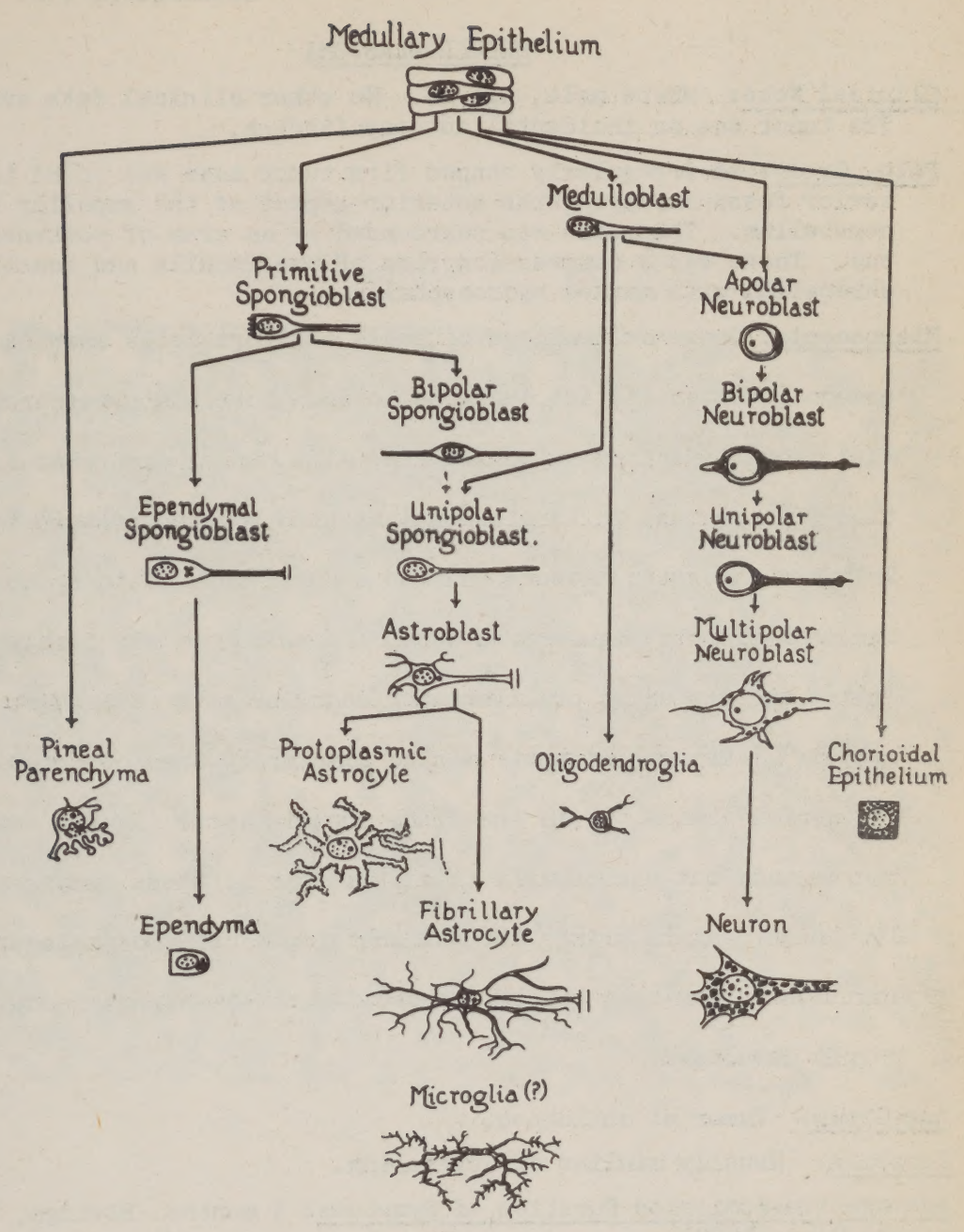
The exact derivation of the microglial cells is unknown. Hortega considers them to be of mesodermal origin, but his views have not gone unchallenged(Pruijs); it is possible that they may be derived, like the oligodendroglia, through the medulloblasts, although the fact that they do not take a part in the formation of gliomas seems strange if they have a common origin from the medullary ectoderm.

It will be seen in the following pages that certain of these cellular types predominate in certain tumors, and Dr. Cushing and I have shown that those tumors composed of more embryonic cells have a shorter clinical course."

From Bailey, P. Histologic Atlas of Gliomas.

Arch. Path. 1927: 4, 871-921.

PLATE I



From Bailey, P. Histologic Atlas of Gliomas.

Arch. Path. 1927: 4, 871-921.

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Neg. 72969

(4)

Accession 46383
(2 slides)

Registered by
Army Medical Museum,
Washington, D.C.

MEDULLOBLASTOMA

Clinical Note: White male, age 18. No other clinical data available. The tumor was an incidental autopsy finding.

Path. Gross: An irregularly shaped firm tumor mass was found in the posterior fossa occupying the anterior aspect of the superior lobe of the cerebellum. This mass was surrounded by an area of softened brain tissue. There was a compression ring of the medulla and tonsils of the cerebellum with marked hydrocephalus.

Microscopic: Dense collections of small, uniform cells showing occasional pseudo-rosettes (A) are characteristic. Note the hyperchromatic nuclei, and the scanty cytoplasm (B). The nuclei are round in cross section (B) and oval in longitudinal section (C) and contain an evenly distributed chromatin network (D) and a small but distinct nucleolus. Occasional mitotic figures are seen. These tumors are highly undifferentiated and represent proliferating medulloblasts (see chart of histogenesis). Because of their marked immaturity they do not respond well to special stains but in the slide spongioblasts (E) and neuroblasts can be made out and usually this is as far as these tumors differentiate. The thionin stain brings out the individual cell morphology. Numerous capillaries are seen but the connective tissue stroma is delicate and poorly developed.

Age Group: Tumor of childhood.

Location: Usually midline of cerebellum.

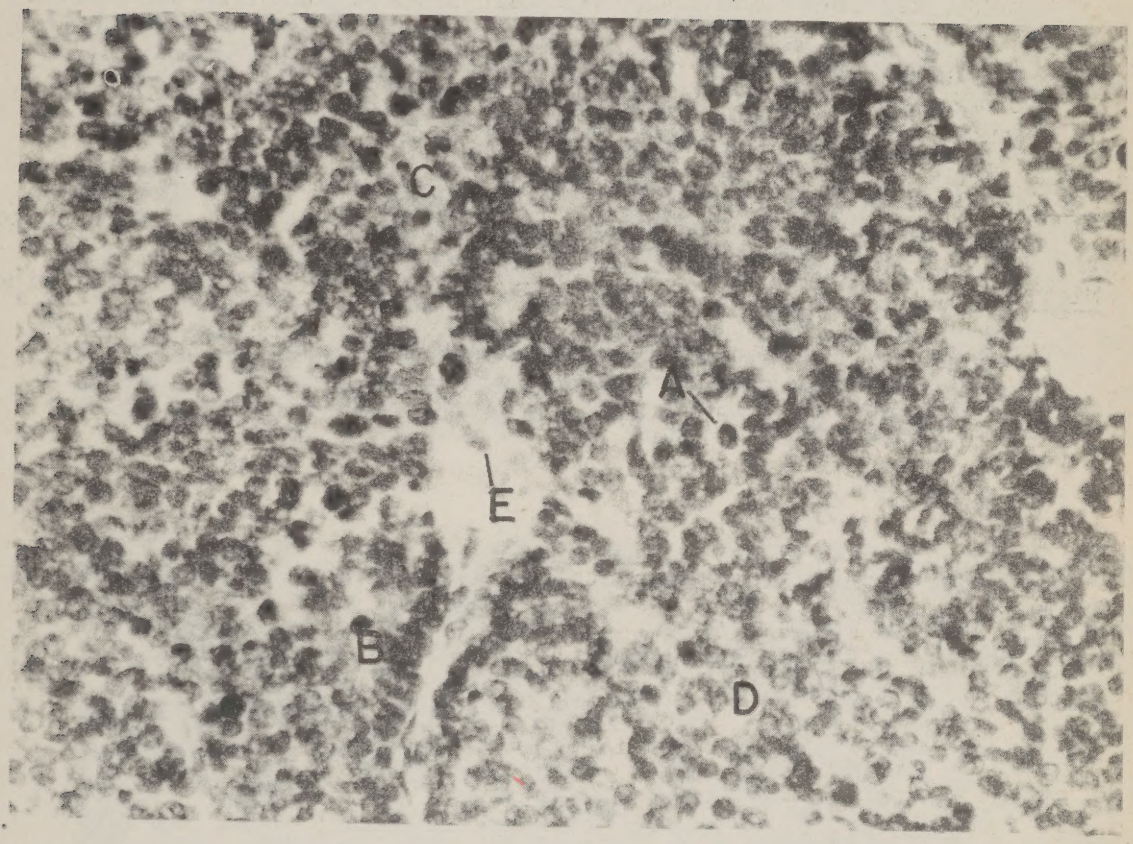
Average Pre-Admission Duration of Symptoms: 5 months. Elvidge, Penfield and Cone (1937).

Operability: These tumors are more primitive and probably more malignant than a glioblastoma but at the same time the anaplasia renders them more sensitive to radiation. Occasionally, if the case is seen early, radical surgery and intense radiation may offer some hope. The usual early onset of hydrocephalus is discouraging but they should not, by any means, be regarded as hopeless tumors.

Slides 1 and 2

(5)

MEDULLOBLASTOMA ACC. 46383



NEG. 72056 X680

Accession 78681-C

Registered by
The Montreal Neurological Inst.
Montreal, Canada *

MEDULLOBLASTOMA

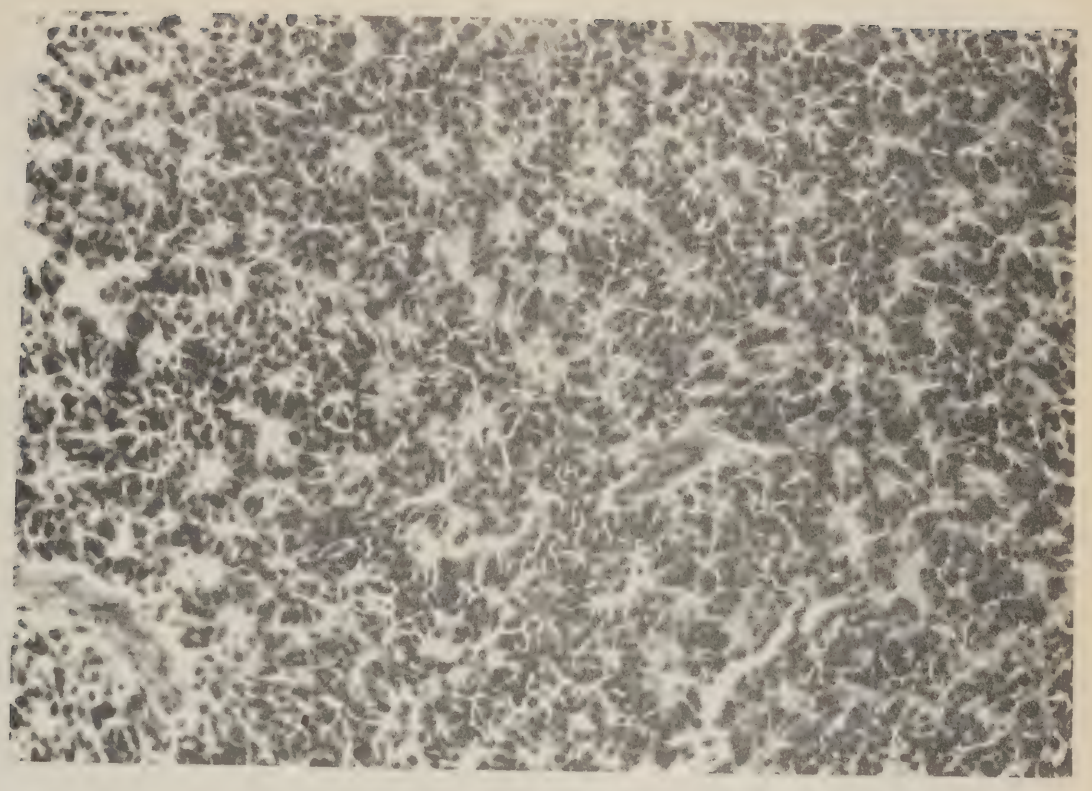
Clinical Note: White male, age 55. Failing vision 4 months, headache, dizziness and staggered gait several months. Objectively there was cerebellar focalizing symptomatology. A suboccipital craniotomy exposed a neoplasm filling the fourth ventricle. Complete removal was not possible, but the large bulk of tumor was removed.

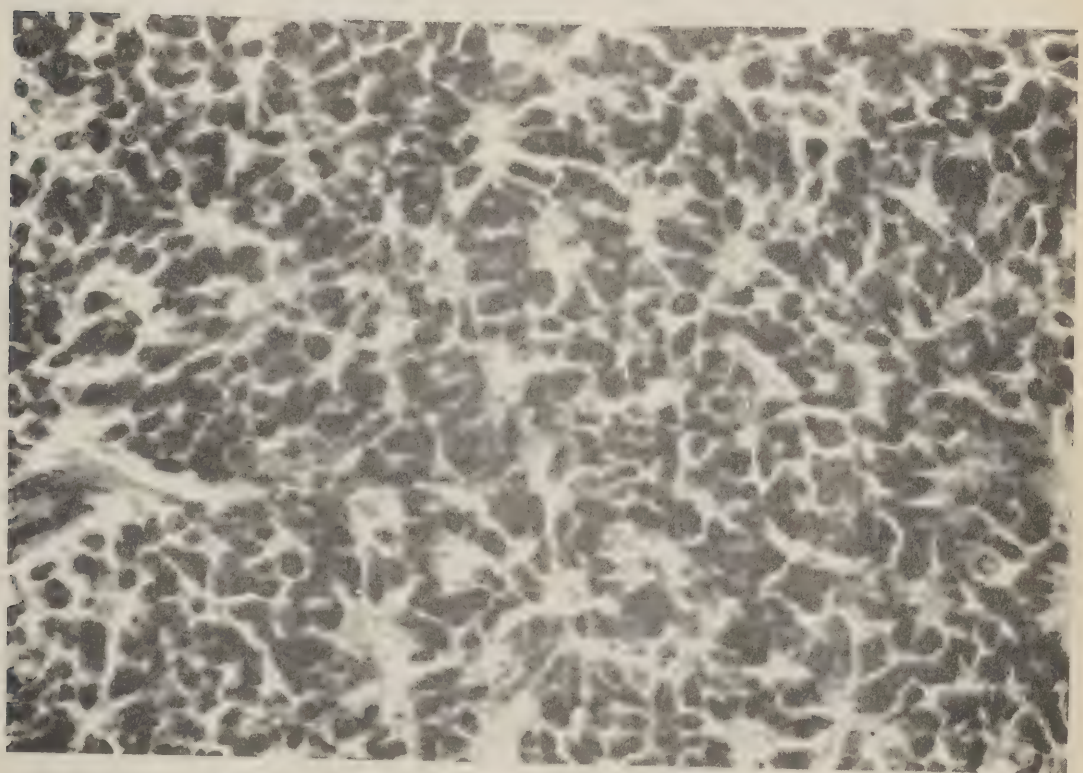
Path. Gross: A soft gliomatous tumor filling the fourth ventricle, attached to the floor and invading the left wall of this ventricle.

Microscopic: This case is to be compared with Accession 46383 (slides 1 and 2). The hematoxylin and Van Gieson stain bring out more clearly the palisading and rosette formation.

*The stained slide was contributed by the Montreal Neurological Institute.

MEDULLOBLASTOMA ACC. 78681-C





NEG. 72663 X230

NEG. 72669 X515

(2)

Accession 78681-D

Registered by
The Montreal Neurological Inst.
Montreal, Canada *

MEDULLOBLASTOMA, "PERITHELIAL SARCOMA"

Clinical Note: White female, age 25. Onset of headache two weeks before admission to hospital. Marked vomiting, disorientation and aphasia also. A left parioto-temporal craniotomy exposed a fairly firm and well-circumscribed tumor. It lay at a depth of about 1 cm. and seemed to present down from the fissure of Sylvius. More tumor tissue was found in the region of the lesser wing of the sphenoid. A rather complete removal was accomplished. The slides were prepared from the surgical specimen.

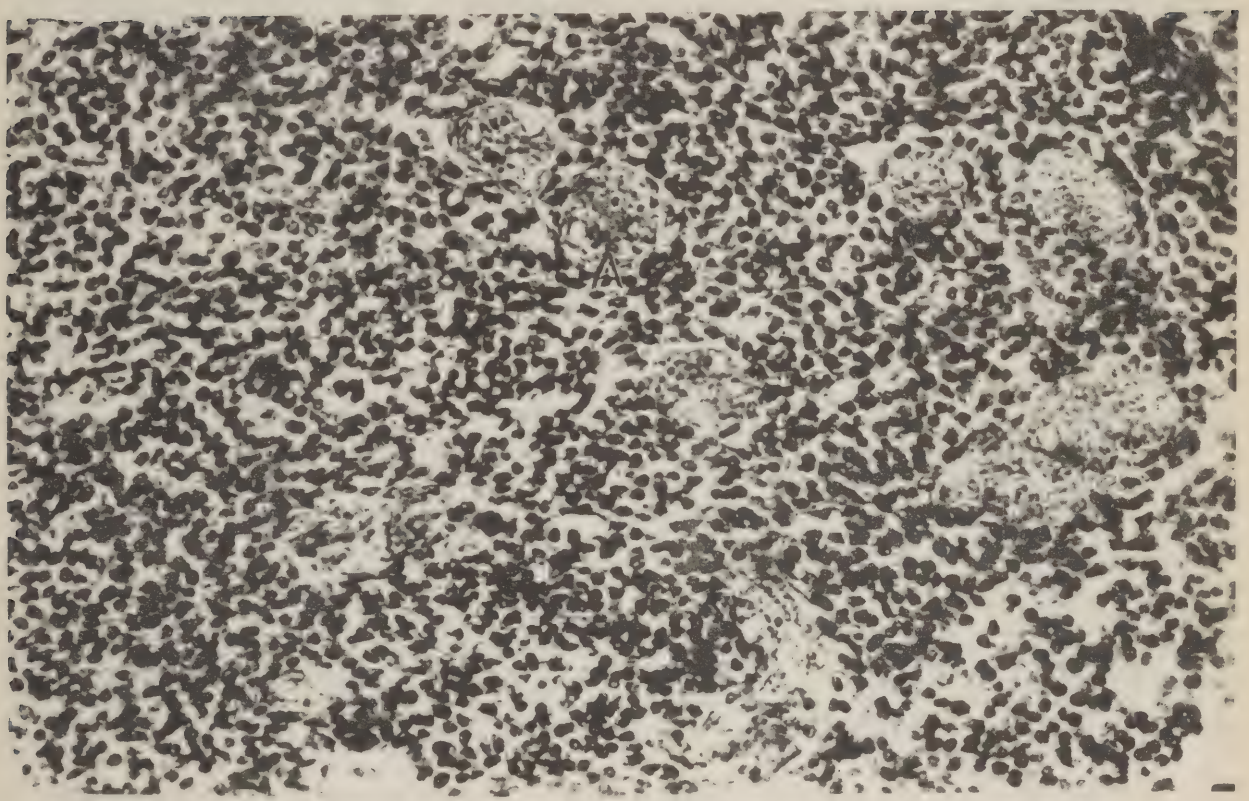
Microscopic: Note the clustering of cells (A) about blood vessels. The clusters appear to be separated by areas of liquefaction necrosis. The type cell (B) is round with scanty but dense cytoplasm and a vesicular nucleus (C). Mitotic figures are seen occasionally.

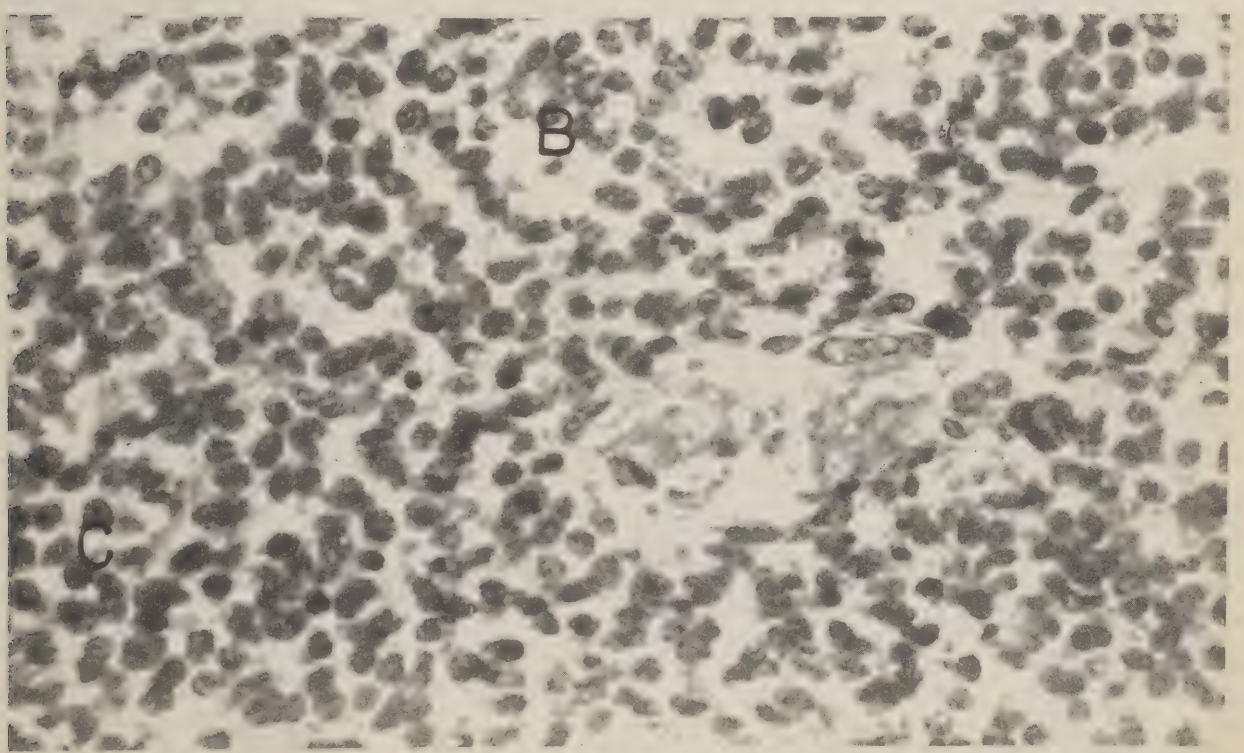
This case was registered as a "perithelial sarcoma" but we prefer the histogenetic term to the morphologic. Differential features that have been described for "perithelial sarcoma" include wrinkling of the nuclear membrane, denser cytoplasm, concentric reticulin arrangement around blood vessels and the presence of connective tissue stroma intermingled with the neoplastic cells. Some believe that these are mesodermal tumors. In the earlier stages the cells appear only about blood vessels and later form solid tumors. This is a rare type.

*The slide is a hematoxylin and Van Gieson stain and was contributed by the Montreal Neurological Institute.

Slide 4

MEDULLOBLASTOMA, "PERITHELIAL SARCOMA" ACC. 78681-D





NEG. 72668 X320 NEG. 72665 X680

Accession 63743
(2 slides)

Registered by
Temple Univ. School of Med.
Philadelphia, Pa.

PINEALOMA

Clinical Note: White female, age 7. Seven years after birth there was a gradual onset of frontal and occipital headache and associated vomiting. About eight months from the onset of symptoms she fell to the left while walking, was forgetful and had a divergent squint of the left eye. Exploratory craniotomy was done and she was found to have an inoperable brain tumor. Death occurred about nine months from the onset of symptoms.

Path. Gross: A massive tumor filling the lateral and third ventricles was found. This tumor extended from the right, pre-frontal area posteriorly to occupy the site of the pineal body. The pineal body could not be identified. The tumor was pink, friable and well demarcated from the brain substance.

Microscopic: Three cell types are constituents of a pinealoma. Note the connective tissue septa (A), the large epithelial-like cells (B) and the lymphoid cells (C). The connective tissue cells are gathered into strands (A) and the lymphoid cells are diffuse (C). The "pineal cell" is one with a large vesicular nucleus delicately reticulated (D), nucleolus (E) and fairly abundant cytoplasm (F). In the P A H stain with high magnification it will be noted that many of the "pineal cells" have short stubby processes (G).

The duration of symptoms in this case was shorter than usual, the average survival period being about eighteen months.

Age Group: Young adults.

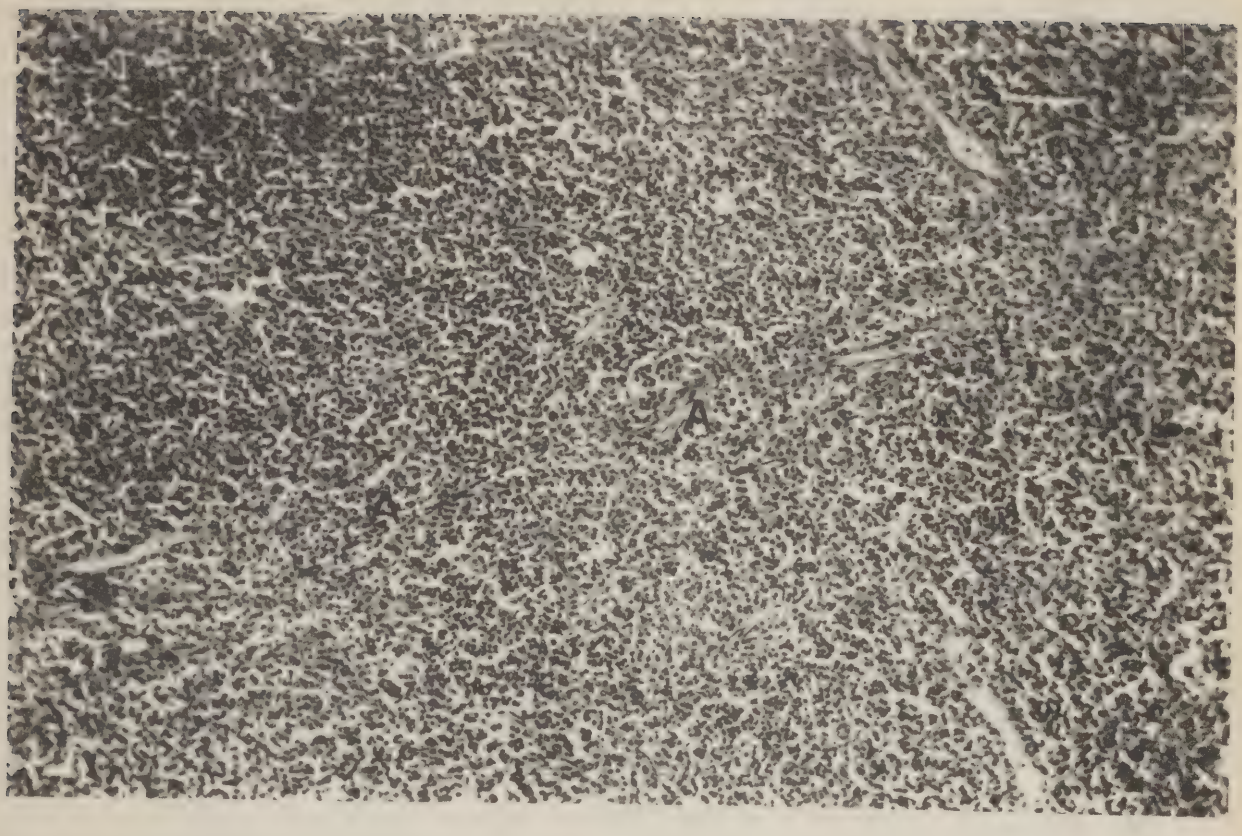
Location: In relationship to the pineal body. The third ventricle is often invaded and secondary implants in the remainder of the ventricular system are not uncommon.

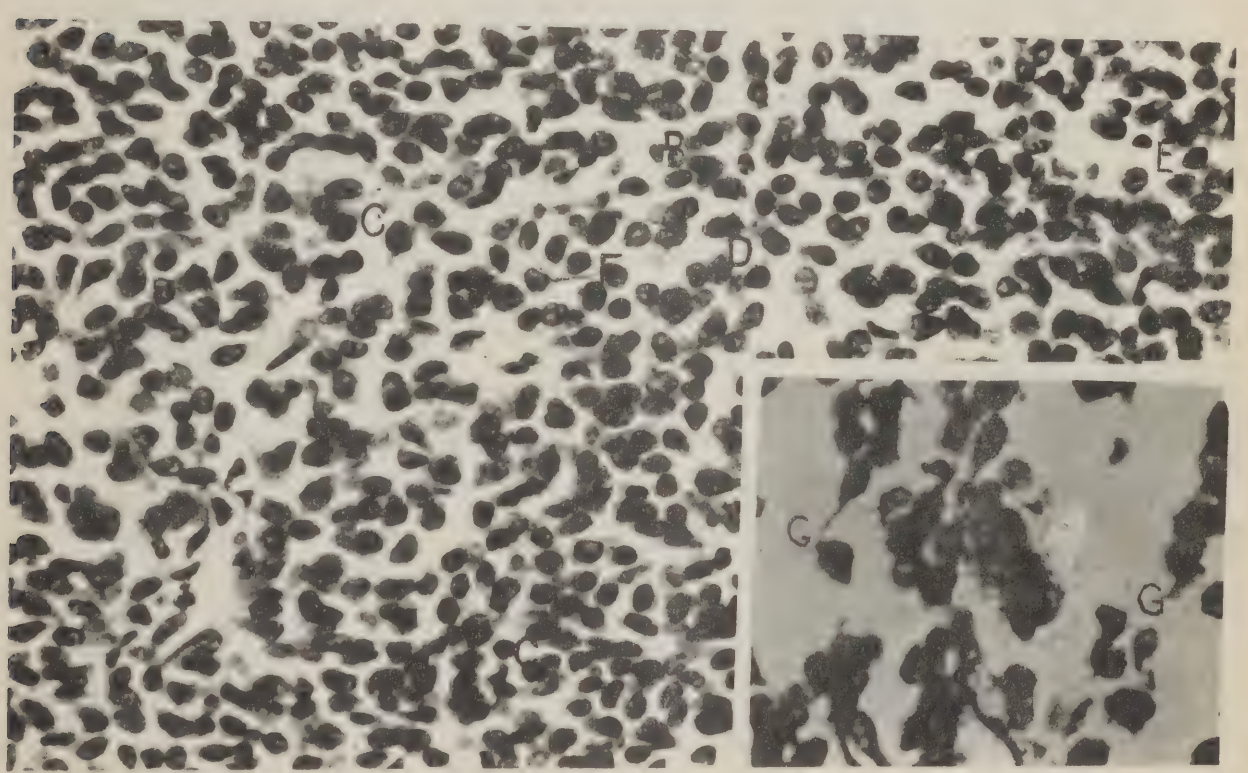
Average Survival Period: 18 months. Bailey and Cushing (1926)

Operability: Discouraging because of inaccessible position.

Slides 5 and 6

PINEALOMA ACC. 63743





NEG. 72119 X125 NEG. 72120 X515 NEG. 72670 X955

Accession 64756
(3 slides)

Registered by
Walter Reed General Hospital,
Washington, D.C.

GLIOBLASTOMA MULTIFORME

Clinical Note: White male, age 47. There was a ten-year history of character changes with esthetic lapses and moral breaks, colored by alcoholism. The patient complained of headache of one month's duration. Following the drinking of a quart of whiskey he became semi-stuporous and remained so until death about a month later. Following admission to the hospital he developed focalizing signs pointing to a right frontal lobe neoplasm. Death occurred suddenly and was thought to be due to hemorrhage into the tumor.

Path. Gross: Large tumor mass located in the right temporal lobe and extending from an area just posterior to the Sylvian fissure to the base of the temporal lobe.

Microscopic: The palisading of cells (A) about necrotic areas (B), pleomorphism and tumor giant cells (C) are striking. Many hyperchromatic nuclei (D) and various cell types of the glia series are seen. Different parts of the same tumor may show differentiation toward spongioblastic, neuroblastic or astrocytic tumor. Both proliferative and degenerative vascular changes are to be noted. The Holzer stain illustrates the characteristic vascular adventitial hypertrophy, while the thionin stain shows the endothelial proliferation likewise characteristic. The pseudosyncytium seen has been described frequently. Fat is present in large amounts. Massive necrosis and hemorrhage common.

Age Group: Fourth and fifth decade. "All gliomas in old people are the type" (Freeman)

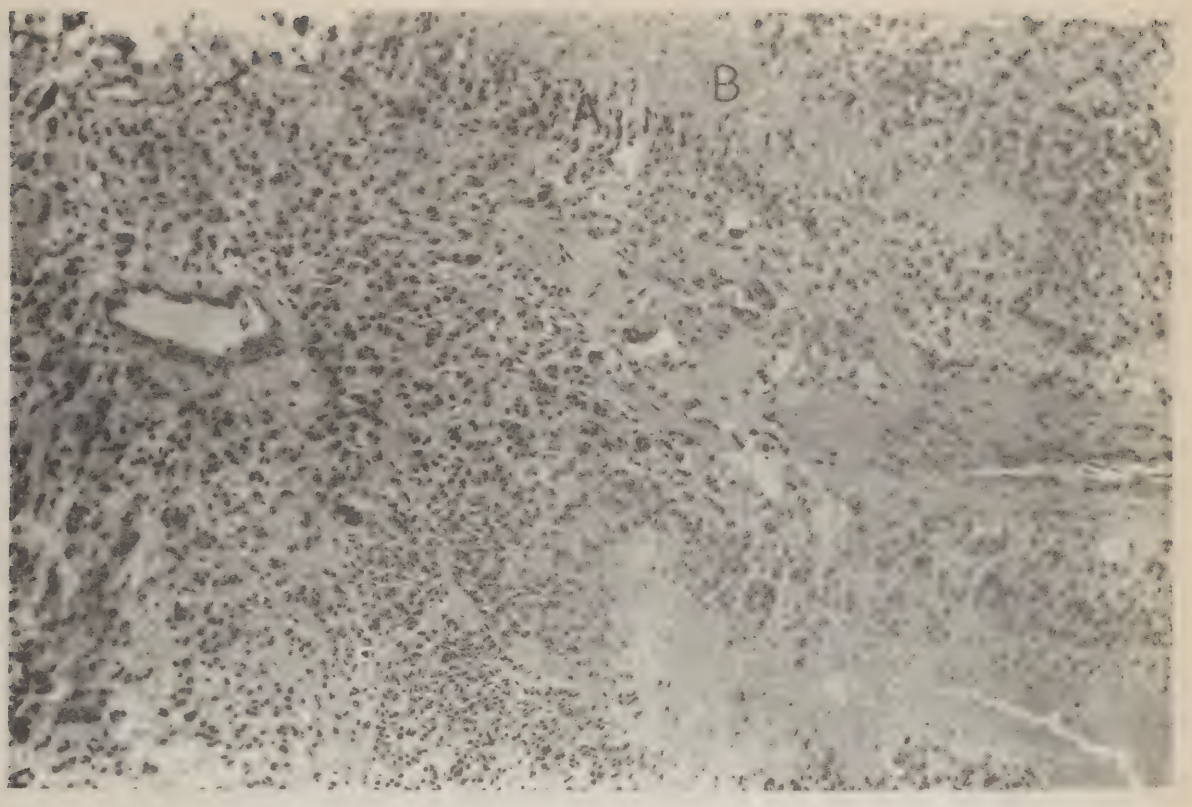
Location: Cerebral hemispheres; also common in spinal cord. Not infrequently multiple, primary.

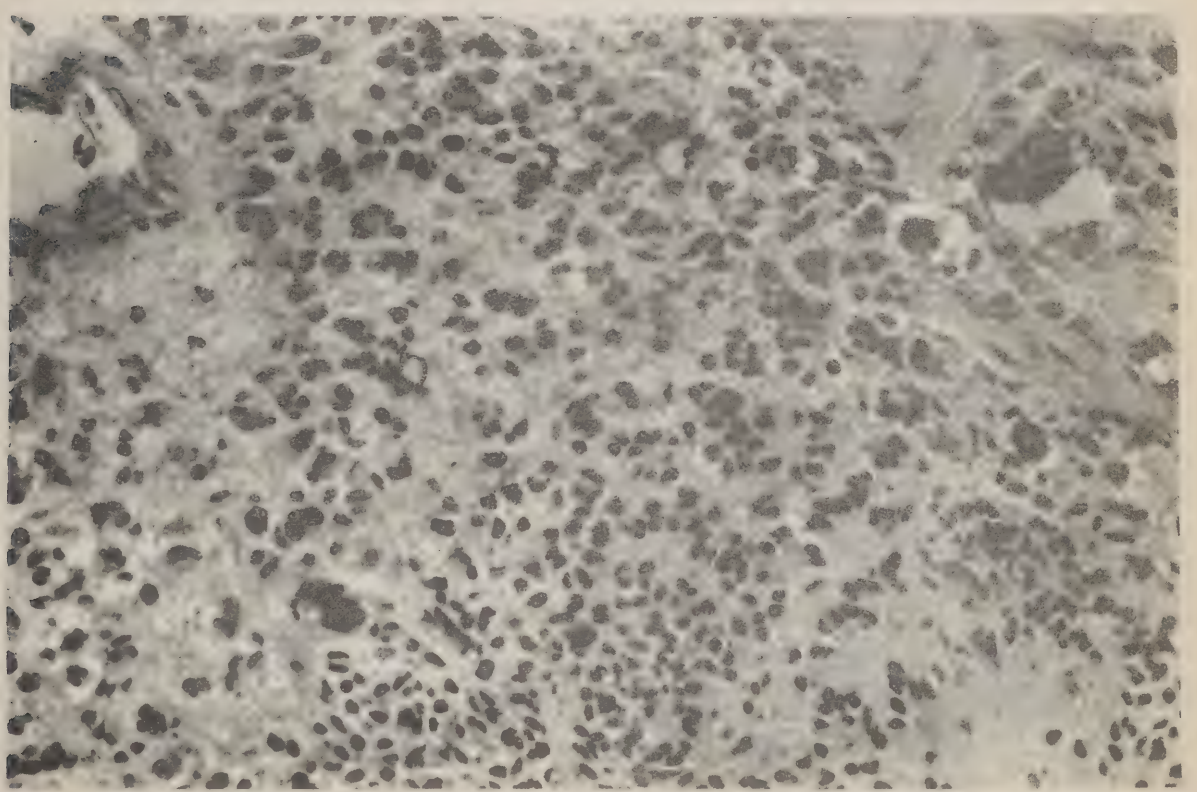
Average Pre-Operative Duration of Symptoms: About six months. Elvidge, Penfield and Cone (1937)

Operability: Ventriculography is dangerous, decompression of little value. Prognosis is very poor but if location permits, radical removal may result in a useful and active prolongation of life for twelve to eighteen months, Elvidge, Penfield and Cone (1937). This tumor can be diagnosed pre-operatively by characteristic vascular picture in arteriogram.

Slides, 7, 8 and 9

GLIOBLASTOMA MULTIFORME ACC. 64756





NEG. 72121 X125 NEG. 72122 X240

Accession 79345
(2 slides)

Registered by
Dr. Walter Freeman
Washington, D.C.

GLIOBLASTOMA MULTIFORME

Clinical Note: White female. The symptoms of only several weeks duration, were those of severe increased intracranial tension. Clinically the neoplasm was localized to the left frontal lobe. The course was rapidly downhill and an emergency ventriculography carried out when she was moribund was not successful.

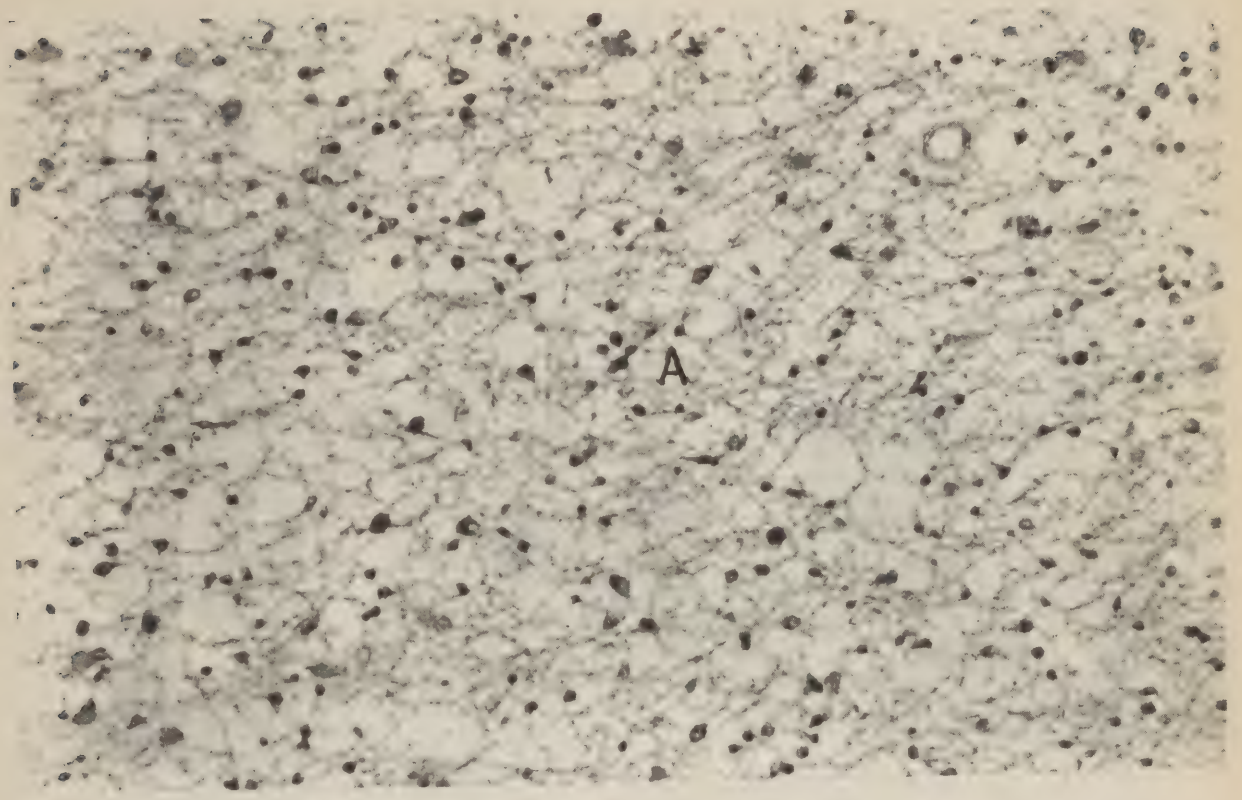
Path. Gross: Tumor was found in the left frontal pole which varied from soft translucent tissue resembling the normal cortex in color to red, granular necrotic tissue. The tumor was very large extending back as far as the insula. The left frontal pole had herniated beneath the falx to indent the other hemisphere; the cerebellum had herniated through the foramen magnum.

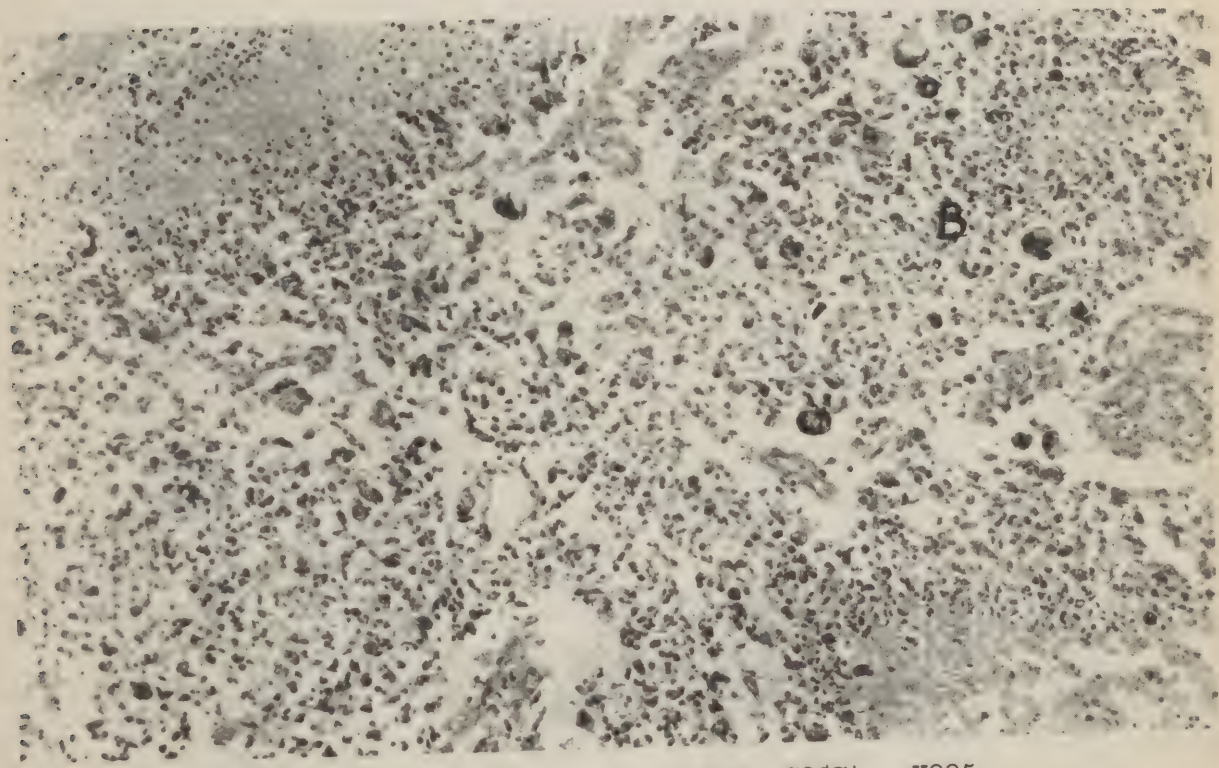
Microscopic: This case is to be compared with Accession 64756 (slides 7. 8 and 9). The striking feature here is the differentiation in some areas (A) toward astrocytic tumor. While the degree of deviation seen in this case is unusual, it is included to emphasize the notorious variability in both gross and microscopic appearances of the glioblastoma. The highly anaplastic areas (B) establish the course of such a tumor.

Dr. Freeman points out that on a number of occasions, operative removal of an apparently benign fibrillary astrocytoma has been followed by the development of an extremely malignant glioblastoma.

Slides 10 and 11

GLIOBLASTOMA MULTIFORME ACC. 79345





NEG. 72875 X225

NEG. 72874 X225

(16)

Accession 79628

Registered by
Dr. Walter Freeman
Washington, D.C.

GLIOBLASTOMA, CORPUS COLLOSUM

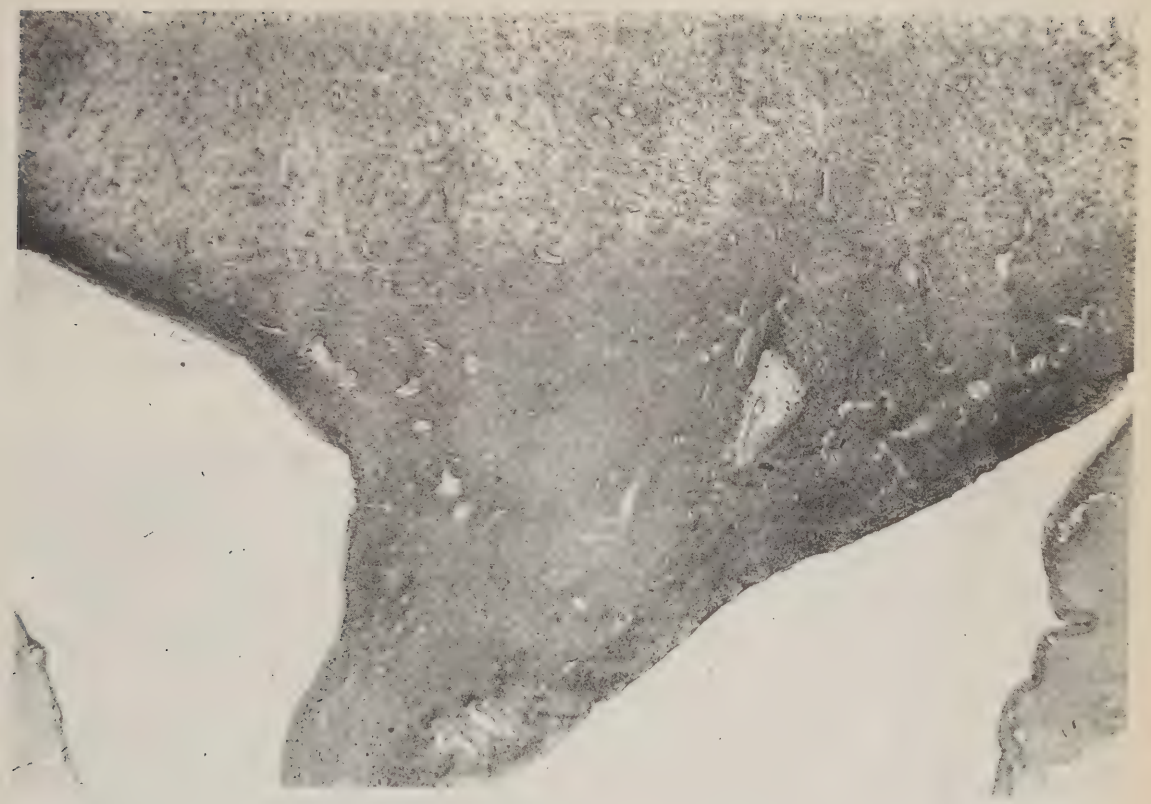
Clinical Note: White female, age 37. Right-sided paresis and difficulty in speech, four months. Negativistic and childish behavior for six weeks. The left carotid arteriogram showed lack of filling of the anterior cerebral vessels. A craniotomy failed to reveal definite tumor which was thought to be deep. Her postoperative course was progressively downhill and she died in about three weeks.

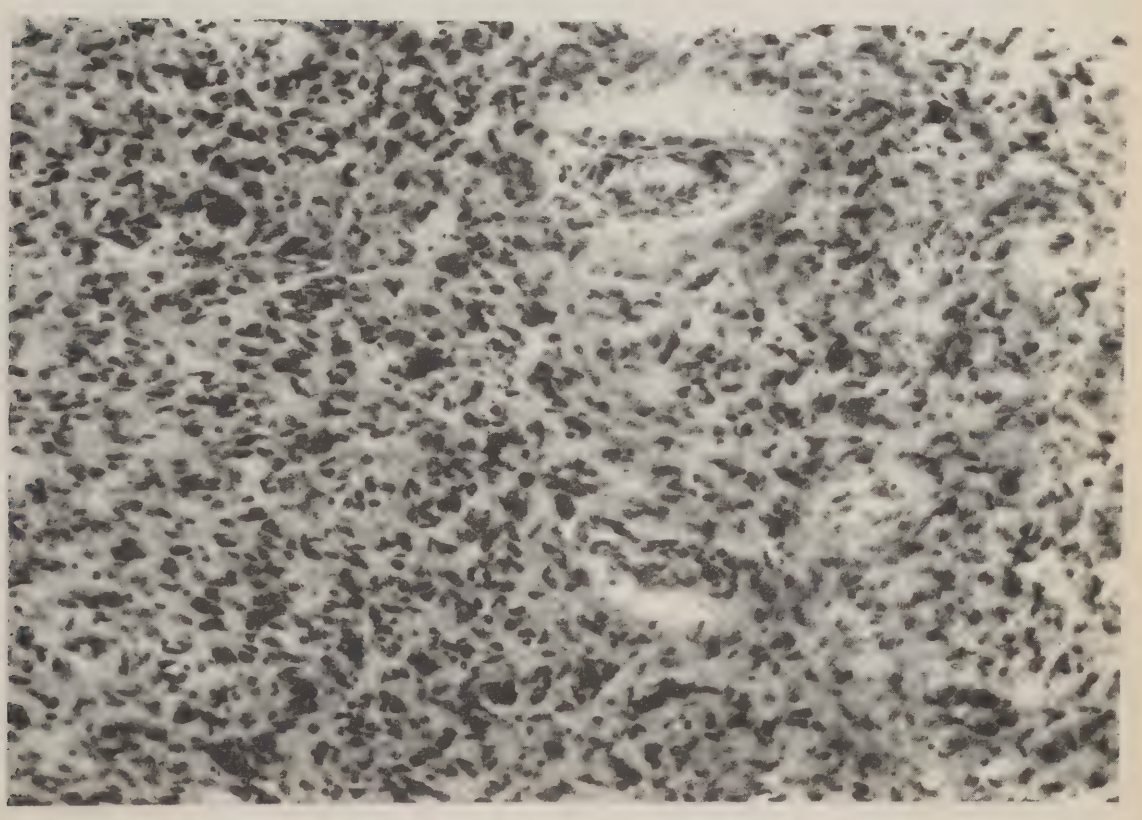
Path. Gross: The corpus collosum and septum pellucidum were greatly thickened by tumor which extended into the left frontal lobe and also into the temporal lobe. Some extension was also noted through the genu into the white matter of the right frontal lobe.

Microscopic: This case is to be compared with Accession 64756 (slides 7, 8 and 9). The section shows tumor invasion of the corpus collosum and septum pellucidum with extension into the adjacent white matter. This neoplasm is seen to be very cellular and pleomorphic. Characteristic vascular changes already described are found. It will be noted that there is no palisading about necrotic areas and giant cells are absent. Dr. Freeman has several cases of corpus collosum tumors in his collection and all show features nearly identical to this case, except for a recent one in which giant cells were seen.

Slide 11A

GLIOBLASTOMA, CORPUS COLLOSUM ACC. 79628





NEG. 72920 X10 NEG. 72917 X205

Accession 67804
(2 slides)

Registered by
Dr. Lester Neuman
Washington, D.C.

POLAR SPONGIOBLASTOMA *

Clinical Note: White female, age 47. Six-month history of mental deterioration, generalized weakness and syncopal headache. Right-sided hemiparesis of two weeks. Autopsy specimen.

Path. Gross: Variegated, fairly well-defined tumor mass was found in the parietal lobe extending from the post central sulcus posteriorly into the occipital lobe. There were secondary hemorrhages in the brain stem.

Microscopic: The tumor is made up of a mass of medium-sized spindly cells with visible cytoplasm (A). They generally have relatively more cytoplasm than the fibroblast. Tadpole-like prolongations of the cell body (B), running of the cells in parallel (C), grouping into fasciculi and absence of neuroglial and fibroglial fibrillae are characteristics of tumor. The P A H stain brings out the spongioblastic process to advantage. An occasional centrosome lying close to the nucleus may be identified.

*Note: This is an area of polar spongioblastoma occurring in a glioblastoma multiforme, but it illustrates the main histologic features of the former tumor. Other salient differential features of the polar spongioblastoma are that they occur in younger individuals, are often located in the brain stem, tend to be fairly well-defined and are more mature histogenetically. Bailey and Cushing (1926) report an average survival period of 46 months in comparison with an average of 12 months for a glioblastoma multiforme. This case should be compared with Accession 77710 (slides 14 and 15).

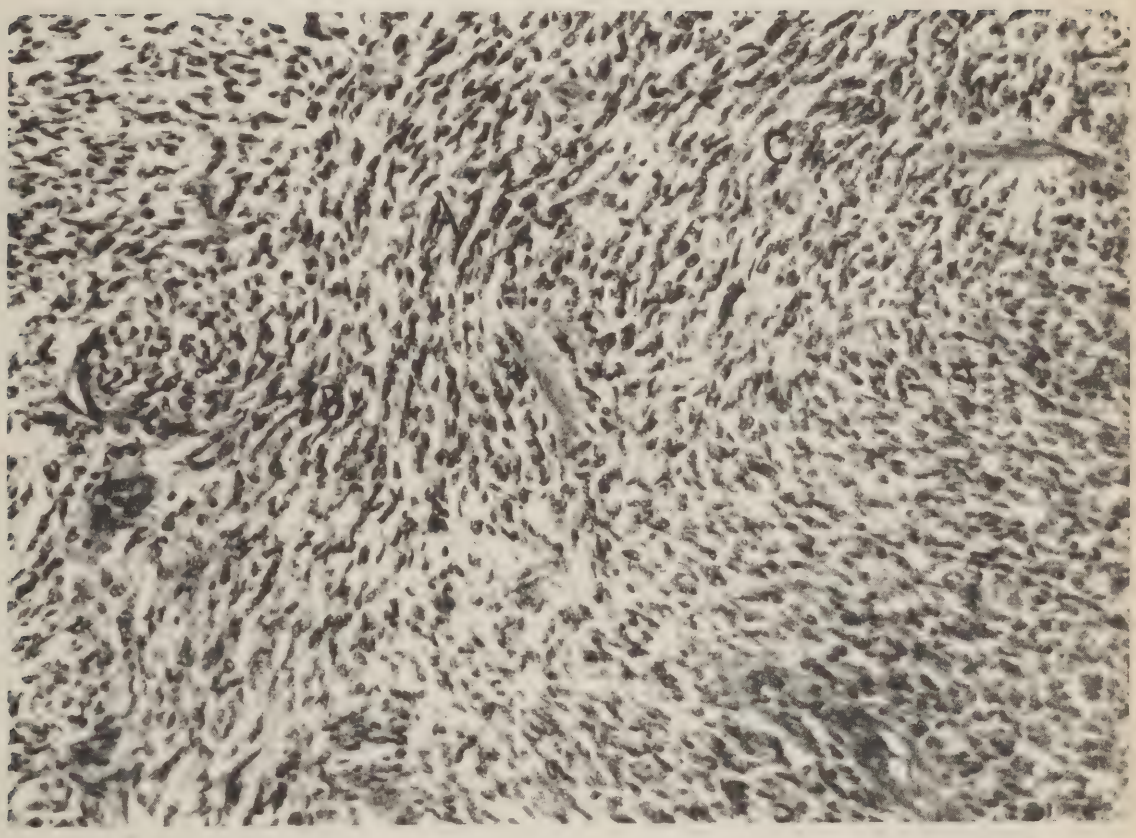
Age Group: Tumor of adolescence or childhood.

Location: Cerebellum and brain stem.

Average Survival Period: 46 months. Bailey and Cushing (1926).

Operability: A benign tumor but removal difficult due to location.

POLAR SPONGIOBLASTOMA ACC. 67804



NEG. 72124 X225

Accession 77710
(2 slides)

Registered by
Dr. Walter Freeman
Washington. D.C.*

POLAR SPONGIOBLASTOMA

Clinical Note: Colored male, age 42. Patient entered hospital with pulmonary edema which responded to the usual therapy. On examination, patient was found to have 5 dioptcrs of papilledema, paralysis of left sixth nerve, partial paralysis of right seventh and considerable visual impairment. He was weak, ataxic in all extremities and quite drowsy. Ventriculography studies showed complete erosion of posterior clinoids, large, dilated symmetrical ventricles and slight distortion of the left ventricle. The clinical impression was pituitary or cerebellar tumor. A left transfrontal craniotomy was carried out but no tumor found. The patient died 12 hours later without regaining consciousness.

Path. Gross: A 2 cm. diameter tumor mass was found in the brain stem. This tumor was very extensive, involving the tegmental structures of the pons and mid-brain and extending into the medulla and cerebellum, also into the meninges.

Microscopic: Study with the hand lens will demonstrate the common location of this tumor. The histologic features discussed in Accession 67804 (slides 12 and 13) are seen in this case with the exception that the tissue is relatively acellular and there is a scattering of polar cells, many of which are cut in cross section.

*The celloidin sections were contributed by Dr. Freeman.

Slides 14 and 15 – see pg 20

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Accession 77184
(2 slides)

Registered by
Dr. Louise Eisenhardt
New Haven, Conn.

EPENDYMOMA, CELLULAR TYPE

Clinical Note: White male, age 9. Unsteadiness and involuntary right-sided position of head for about six months. Bedridden and vomiting for about three months. History of blurring of vision for about three months followed by total blindness eight days prior to admission. Objectively, the patient was bedridden, totally blind and the position of the limbs was that of flexion. There was 5-D choked disc, beginning optic atrophy, neck rigidity and cerebellar symptomatology.

March 19, 1928. (Dr. Cushing) 1. Suboccipital exploration. Puncture of ventricle disclosing hydrocephalus; full cerebellar hemispheres with considerable herniation of tonsils; widened and fairly prominent uvula. Vertical incision of uvula by electrosurgical methods, finally exposed tumor which was partially excavated. Bisection of tumor; removal of its right half followed by respiratory failure. Artificial respiration. Closure.

March 27, 1928 (Dr. Cushing) 2. Reopening of operative wound. Re-exposure of left half of tumor which was partly necrotic. Extirpation of this portion of the tumor largely by electrosurgical methods.

End Result. The boy was blind and in a pitiable state on admission and although he picked up after operation it was realized that there was not much hope for recovery. Efforts were therefore made to keep him hospitalized till the end which occurred on Sept. 2, 1928.

Microscopic: A striking characteristic is the tendency for tumor cells to radiate (A) around blood vessels forming a wide perivascular area filled with fibrillary extensions of the cells (B). Note the dense cellularity. The type cell is the ependymal cell (C); the nucleus is oval, the cytoplasm abundant and continued out into a tail process. There is a definite formation of ependymal epithelium (D) where the cells line spaces to form true rosettes. Grouping of cells into pseudo-rosettes (E) must be differentiated from the true rosettes. The P A H stain brings out the processes of the cells. Note hyperplastic vessels and connective tissue.

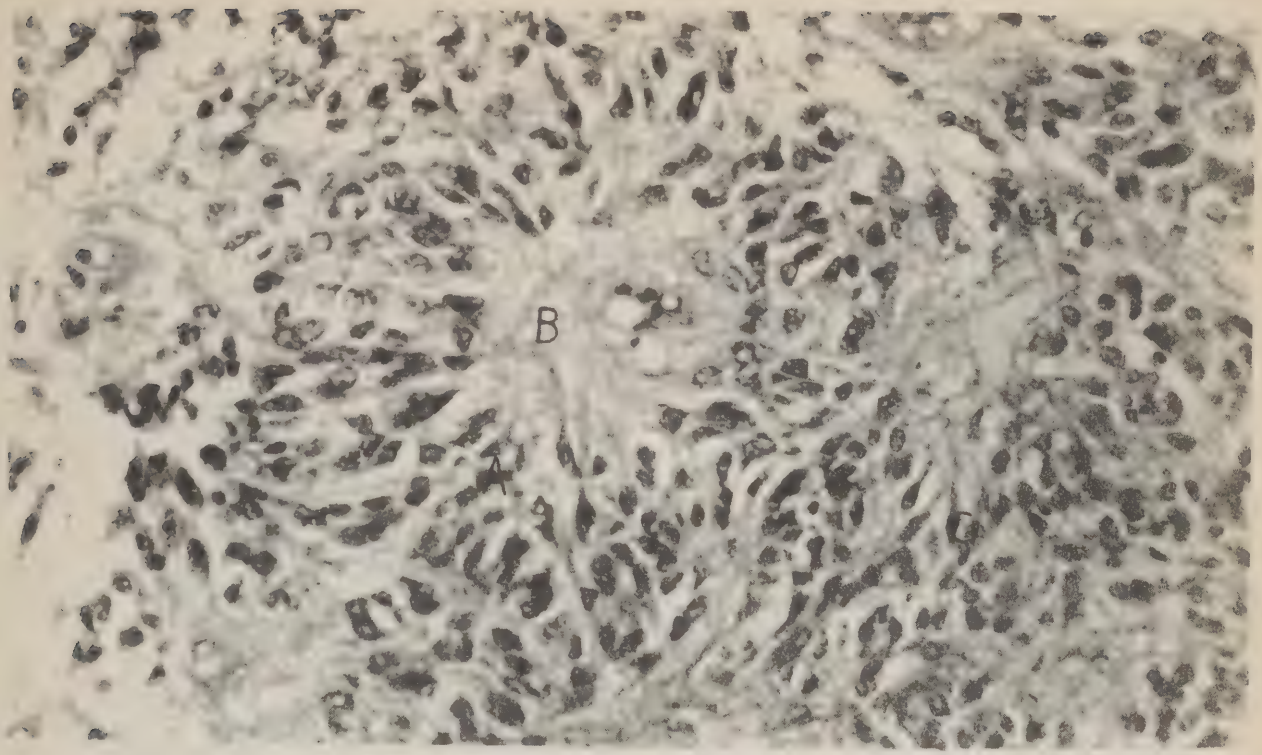
Kernohan (1937) grouped the ependymomas together and found three different types occurring in the cerebrospinal axis; the epithelial, cellular and myxopapillary types. The choroid papilloma was included in this classification as the fourth type.

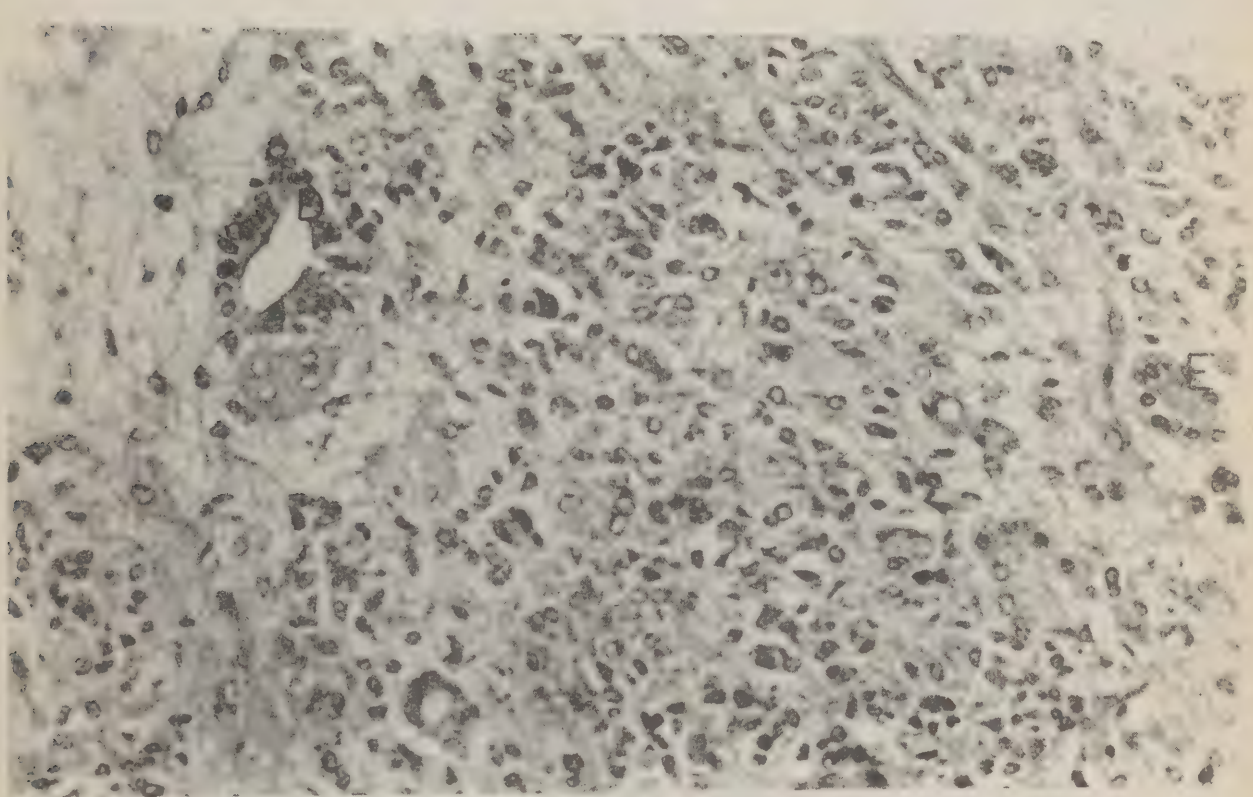
Location: Most common of all gliomas in the spinal cord. The fourth ventricle is the favorite site in the brain.

Operability: A relatively slow-growing tumor but extirpation difficult because of location. They are radiosensitive and there may be definite possibilities for this type of therapy in the future.

Slides 16 and 17

EPENDYMOMA, CELLULAR TYPE ACC. 77184





NEG. 72599 X350 NEG. 72600 X350

Accession 78681-H

Registered by
The Montreal Neurological Inst.
Montreal, Canada

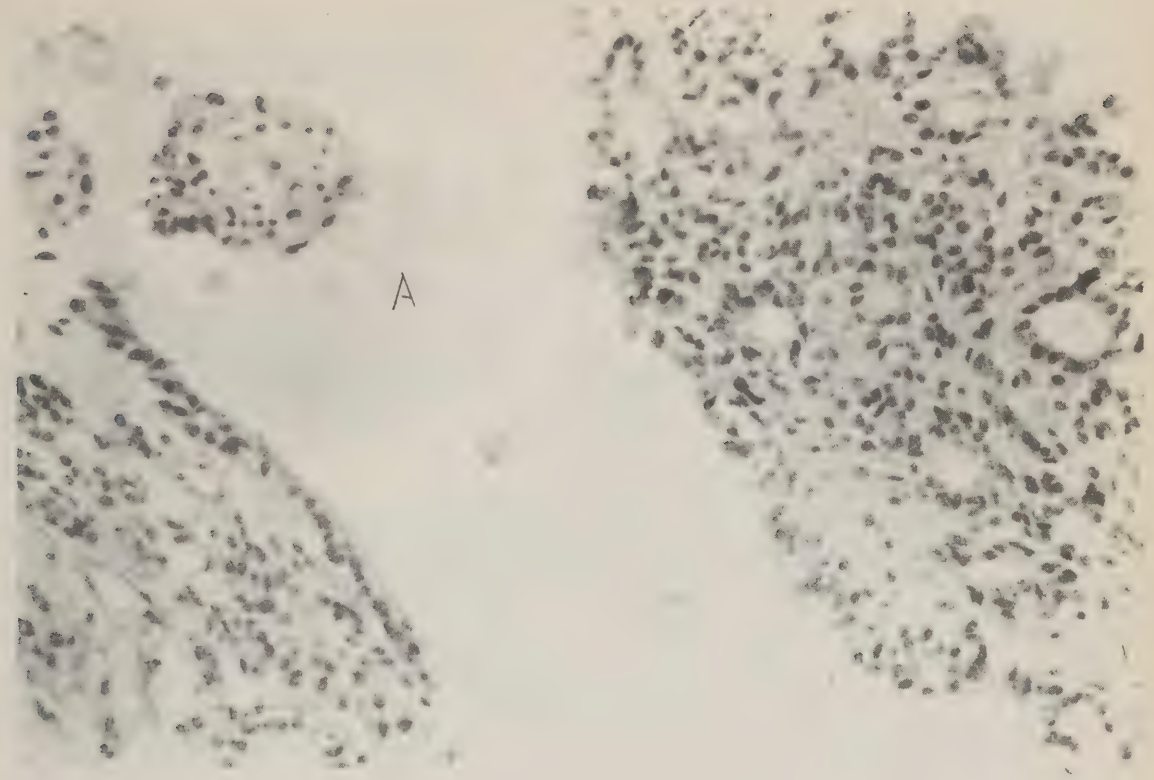
EPENDYMOMA, EPITHELIAL TYPE

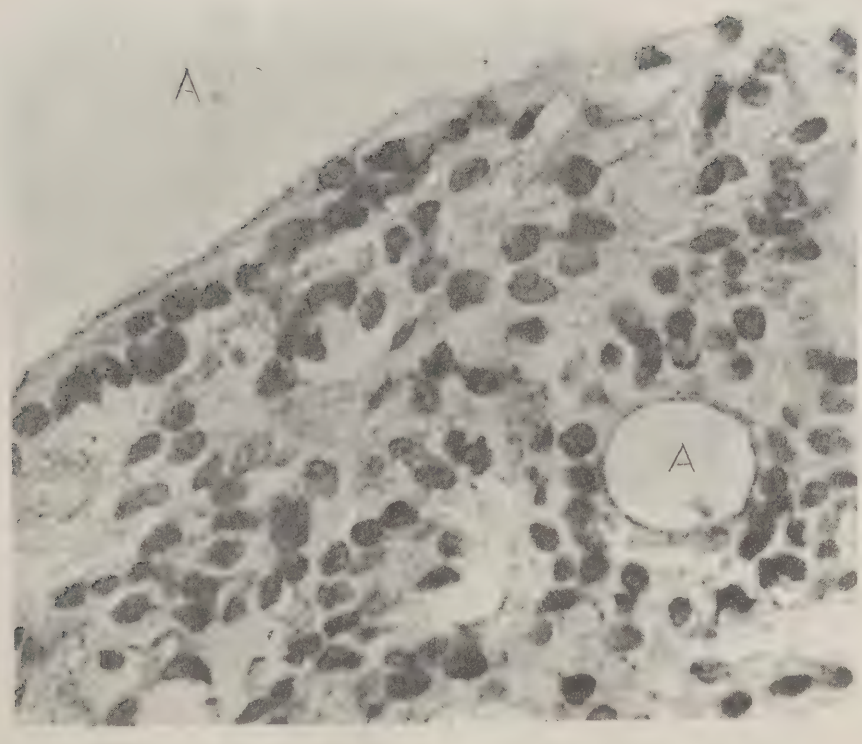
Clinical Note: White male, age 36. Admitted to the hospital in November 1937 complaining of radiating left shoulder pain at intervals since June 1936. Also weakness of the left hand and numbness of the fingers. A cervico-thoracic laminectomy was done and an intramedullary tumor was found that extended from the third cervical to the sixth thoracic segment. It was solid in its upper portion and a large syringomyelic cavitation in its lower portion. The tumor was partially removed.

Microscopic: This case is to be compared with Accession 77184 (slides 16 and 17) and illustrates another variety of ependymoma. Here again we see a definite perivascular distribution and the type cell as the ependymal cell already described. The striking feature is the grouping of cells to form spaces (A) lined by ependymal epithelium (B) to resemble very remarkably the central canal or the ventricles of the central nervous system. The term "epithelial type" is used because of the cohesiveness of the cells.

Slide 18

EPENDYMOMA, EPITHELIAL TYPE ACC. 78681-H





NEG. 72658 X240 NEG. 72659 X600

Accession 78681-B

Registered by
The Montreal Neurological Inst.
Montreal, Canada*

EPENDYMOMA, MYXOPAPILLARY TYPE

Clinical Note: White male, age 61. Pain in mid dorsal region of back in December 1939. Onset of numbness in feet and legs with rapid paralysis of both lower extremities in January 1940. Retention of urine and feces with rapid progress downhill to death in March 1940.

Path. Gross: Located at the level of the 5th dorsal segment of the spinal cord was found a firm white circumscribed oval mass. The mass was entirely intramedullary and measured 12 x 8 x 5 mm.

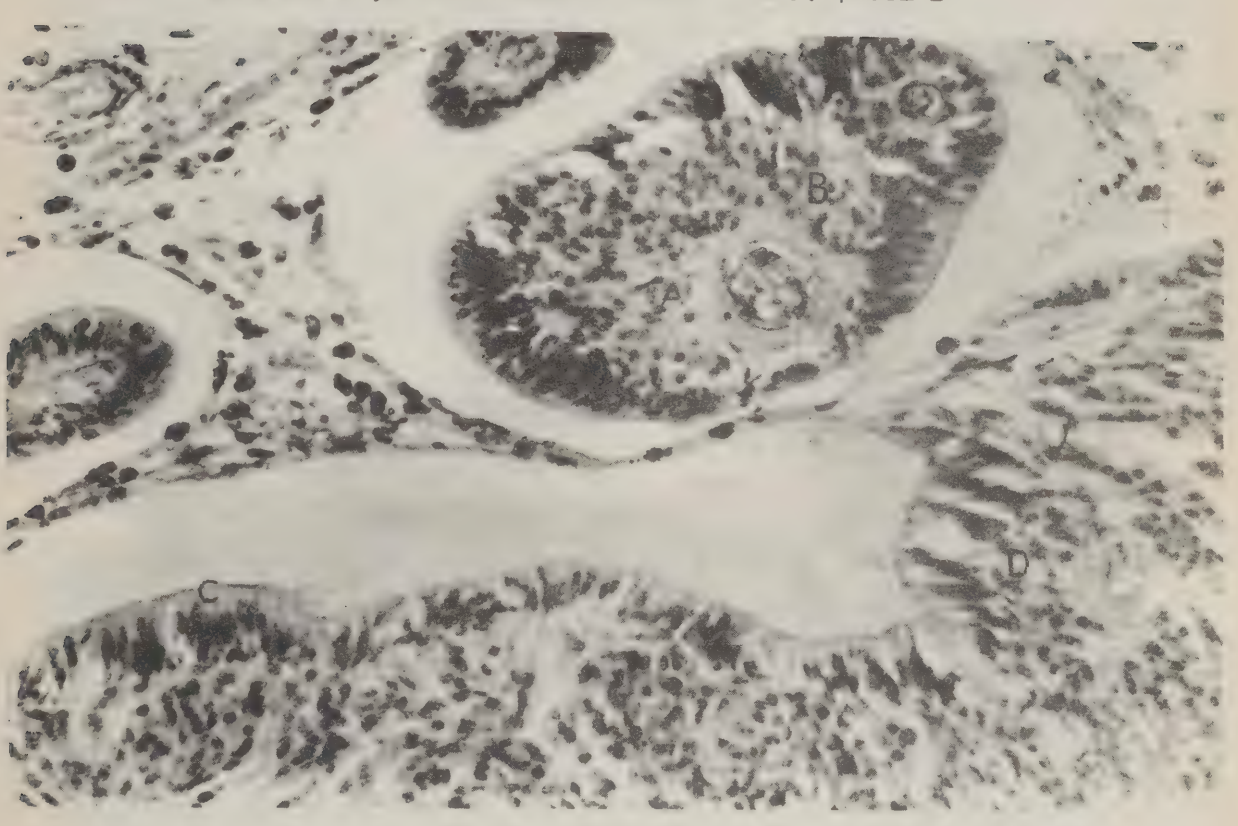
Microscopic: This case should be compared with Accession 77184 (slides 16 and 17) and represents another variety of ependymoma. Papillary projections (A) which have been cut across are seen. The connective tissue stroma (B) is dense and vascular. The ependymal lining cells (C) are high cuboidal, non-vacuolated and have a short, heavy process (D) projecting toward the core of the papilla. The stroma often shows myxomatous degeneration. The perivascular distribution already described is to be noted here.

*The stained slide was contributed by the Montreal Neurological Institute and is a hematoxylin Van Gieson stain.

Slide 19

(07)

EPENDYMOMA, MYXOPAPILLARY TYPE ACC. 78681-B



NEG. 72661 X240

Accession 78479
(2 slides)

Registered by
Dr. Walter Freeman
Washington, D.C.

ASTROBLASTOMA

Clinical Note: White male, age 44. Ten-month history beginning with nausea and vomiting and at times associated with dizziness. Several episodes of complete loss of consciousness. These episodes suggested petit mal attacks and a ventriculogram was done. This showed symmetrically dilated ventricles. The aqueduct but not the fourth ventricle was visualized. It was thought that the patient had a posterior fossa tumor and a suboccipital exploration was done immediately.

Path. Gross: At operation a tumor was found lying in the fourth ventricle. The tumor extended through the foramen magnum under the second cervical vertebra. The end could not be seen. The tumor measured 3 to 4 cm. in its transverse diameter. It was constricted by the foramen magnum but enlarged again in the cervical to a diameter of 3.5 cm. Infiltration was not definite but complete removal was not attempted.

Following his operation in April 1938, patient improved for a short time, but in July he appeared to be going downhill but refused re-operation. In October 1938 the patient died. At autopsy he was found to have severe bronchopneumonia and the tumor already described had invaded the cerebellar hemispheres.

Microscopic: The histologic appearance lies midway between the glioblastoma and astrocytoma as does the biological behavior. These tumors may be either benign or malignant clinically. Note the marked hypertrophy of the vessel walls (A), the palisading of cells about the vessels (B), most markedly the formation of brush-like fibers forming the foot plates (C). In the P A H stain the connective tissue is tannish-brown in color and the glia foot plates steel blue. While many of the cells simulate astrocytes (D), others are more immature. Not uncommonly pseudoganglion cells and giant cells are seen, but not in this case. These tumors have been mistaken for ganglioneuromas.

Age Group: Varies greatly.

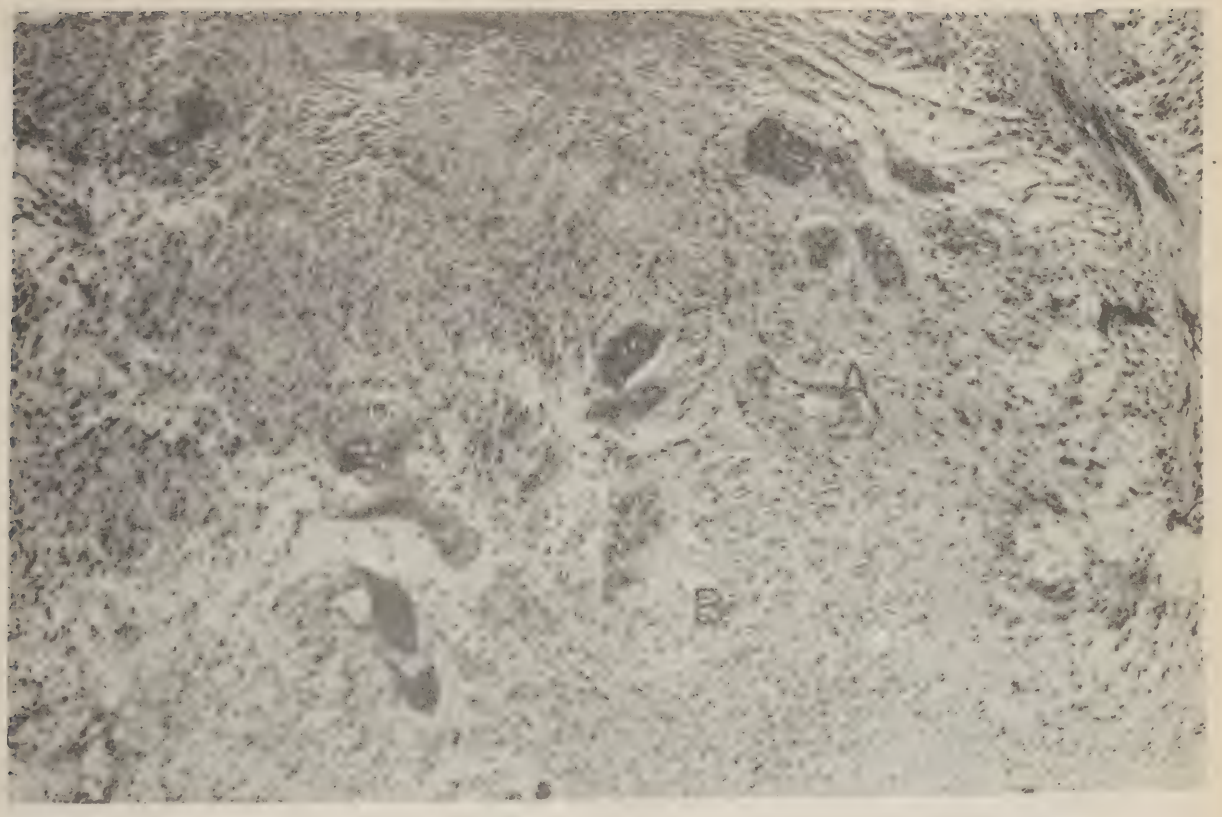
Location: Usually cerebrum, often cerebellum.

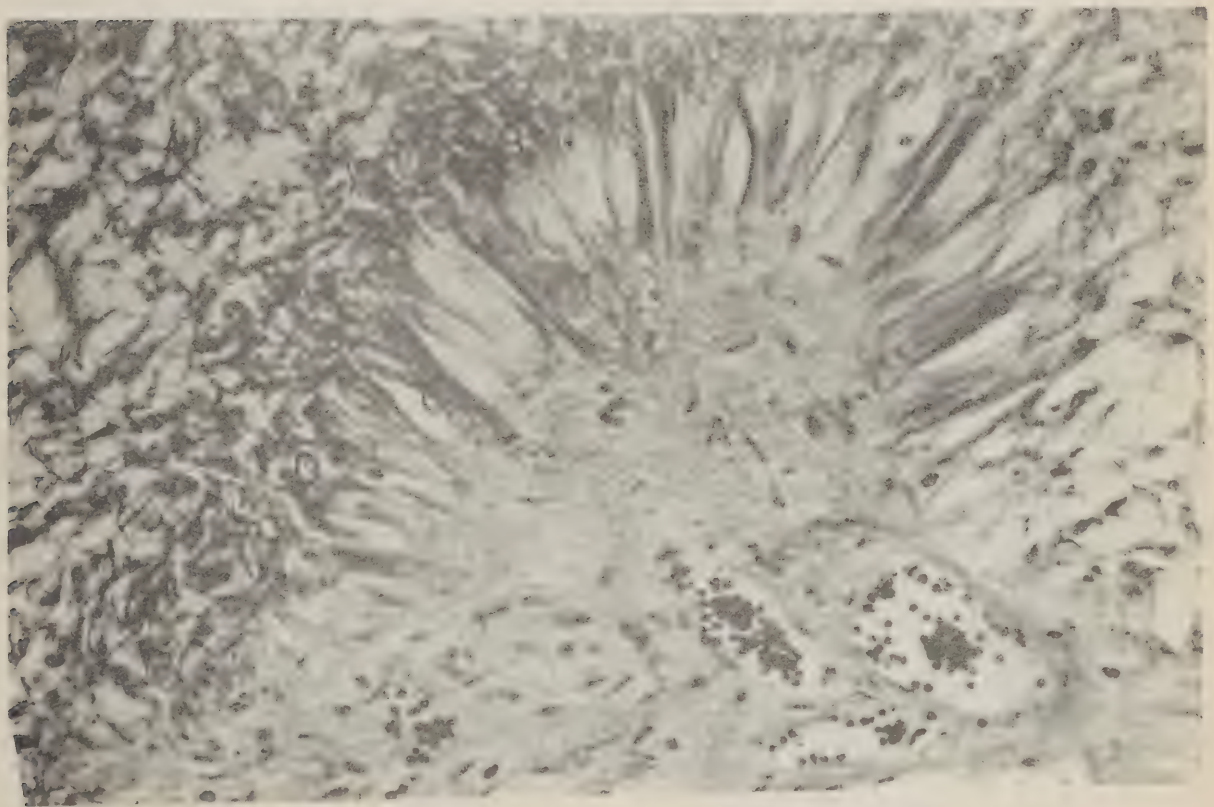
Average Pre-Operative Duration of Symptoms: 14 months for the cerebral cases. Elvidge, Penfield & Cone (1937)

Operability: See above.

Slides 20 and 21

ASTROBLASTOMA ACC. 78479





NEG. 72654 X75

NEG. 72653 X335

Accession 59623
(2 slides)

Registered by
Army Medical Museum
Washington, D.C.

ASTROCYTOMA

Clinical Note: White male, age 30. Epileptiform seizures for five years. Mental cloudiness and daily epileptiform attacks with gastric aura prior to death. Terminal bronchopneumonia.

Path. Gross: A cystic tumor mass with no definite visible demarcation between tumor and brain substance, extensively involving the right frontal, temporal and parietal lobes. Pressure coning of the cerebellum.

Microscopic: The normal architecture is replaced by a fairly well-differentiated tumor made up of uniform cells with an irregular distribution. The type cell is one with moderate amount of cytoplasm and a rather large vesicular nucleus (A). However, some variability (B) and (C) is noted. Well-developed fibrillar processes (D) are seen that appear to run out in long strands from the cell body. In the P A H stain is seen a dense feltwork of glia fibrils which stain blue. The H & E stain shows nuclear morphology. The ganglion cells commonly found are probably enclosed in the infiltrating tumor.

Age Group: Fourth decade.

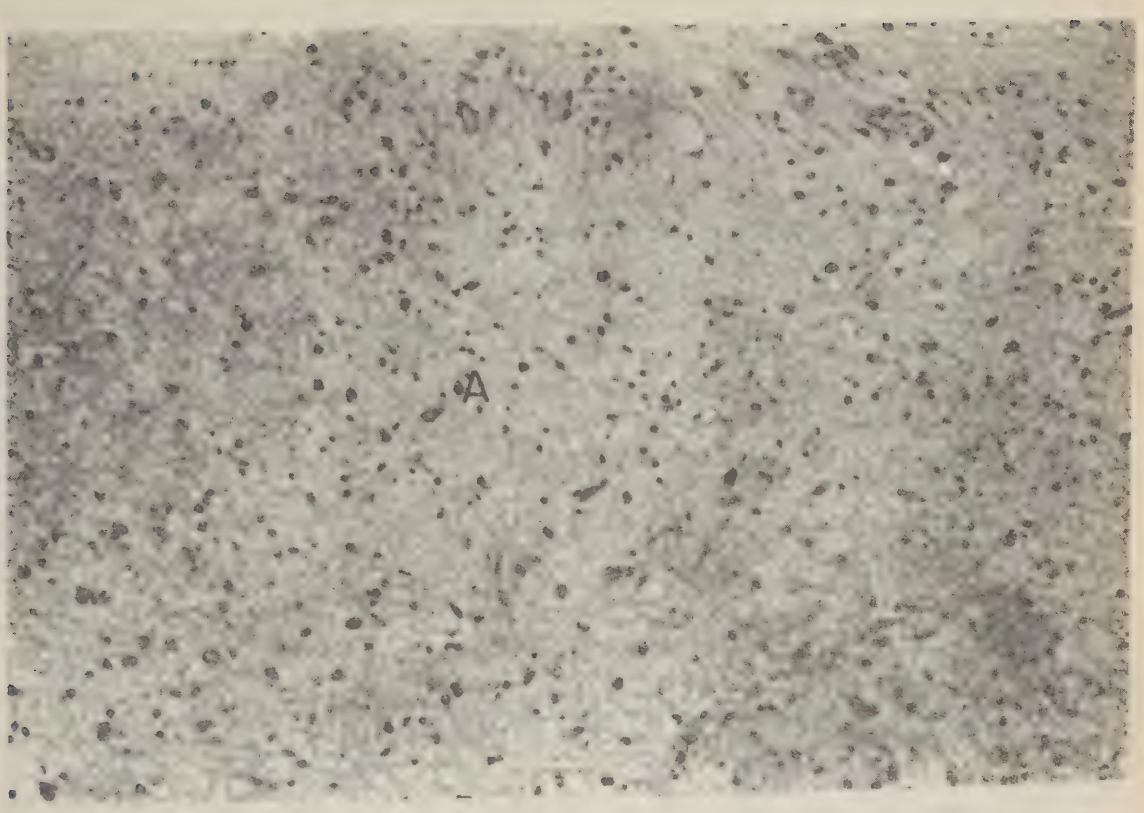
Location: Cerebral hemispheres, particularly the frontal lobes. Cerebellar hemispheres in childhood.

Average Pre-Operative Duration of Symptoms: 33.9 months for 31 cerebral cases. A few cases as long as 8 and 10 years. Elvidge, Penfield and Cone (1937)

Operability: Excellent, if location permits a complete removal. Elvidge, Penfield and Cone (1937) found that out of 41 patients who had radical removals, 23 showed an average survival of over three years and were still living at the time of analysis. Some survivals of 30 years are reported. The drainage of cysts often produces marked remission of symptoms.

Slides 22 and 23

ASTROCYTOMA ACC. 59623



NEG. 72116 X185

NEG. 72118 X515

Accession 80843-A

Registered by
The Montreal Neurological Inst.
Montreal, Canada.

ASTROCYTOMA, PILOCYTIC TYPE

Clinical Note: White male, age 8 years. Seven-month history of headache accompanied by decreased auditory acuity of two months' duration. Shortly prior to admission there was staggering to the right, weakness of the legs, and neck stiffness. Ventriculogram studies showed an expanding intracranial lesion in the posterior fossa and a block in the region of the aqueduct and fourth ventricle. While the skin flap was being turned for suboccipital craniotomy following encephalography, the patient expired in spite of emergency ventricular puncture.

Autopsy Report: Tumor of left occipital pole of brain.
Hyperemia of lungs.
Congenital deformity of left kidney.

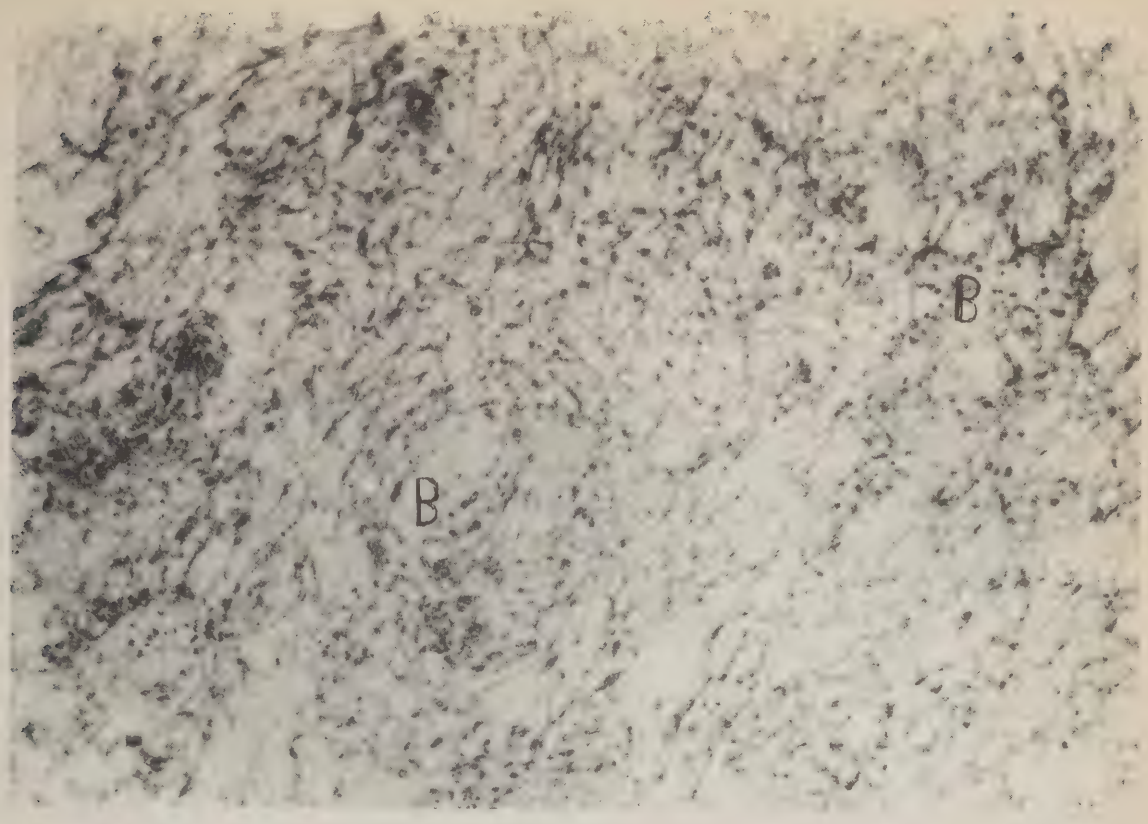
Microscopic: Characteristic features are the dense feltwork of glial fibers (A) and cyst formation (B). This is a phosphotungstic acid hematoxylin stain and demonstrates the richness of these tumors in glial fibers. A tendency is noted for the fibers to run parallel extending outward from the cell body for some distance (C). The cysts probably represent liquefaction necrosis and are seen to contain coagulated serum.

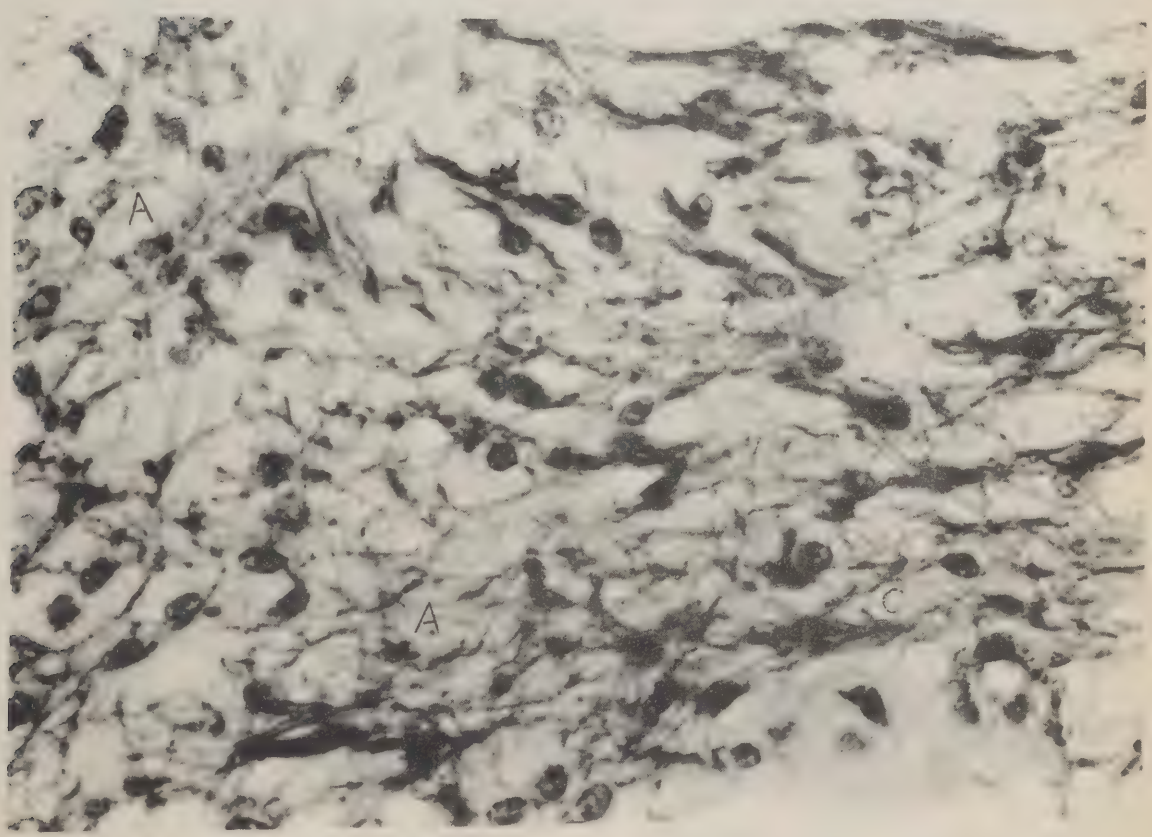
Elvidge, Penfield and Cone (1937) are at disagreement with the classification of astrocytomas as fibrous and protoplasmic because of the transformation of the protoplasmic to the fibrous astrocyte under pathologic conditions. They recommend division into the pilocytic, gemistocytic and diffusum types. This latter classification has both morphologic and clinical justification.

The pilocytic astrocytoma offers the best prognosis of all. It occurs in the cerebellum as well as the cerebrum.

Slide 23A

ASTROCYTOMA, PILOCYTIC TYPE ACC. 80843-A





NEG. 73036 X165

NEG. 73032 X680

Accession 80843-B

Registered by
The Montreal Neurological Inst.
Montreal, Canada

ASTROCYTOMA, GEMISTOCYTIC TYPE

Clinical Note: White male, age 52 years. In 1933 he had a giant cell astrocytoma removed from the left frontal lobe. Seven years later he was readmitted with rather marked mental symptoms. Encephalogram showed an expanding intracranial lesion in both frontal regions. A left osteoplastic craniotomy was done. A massive recurrence was found, tumor being present in both frontal lobes and pushing the whole ventricular system backwards. Radical removal was again carried out. He died on the 4th post-operative day following anuria.

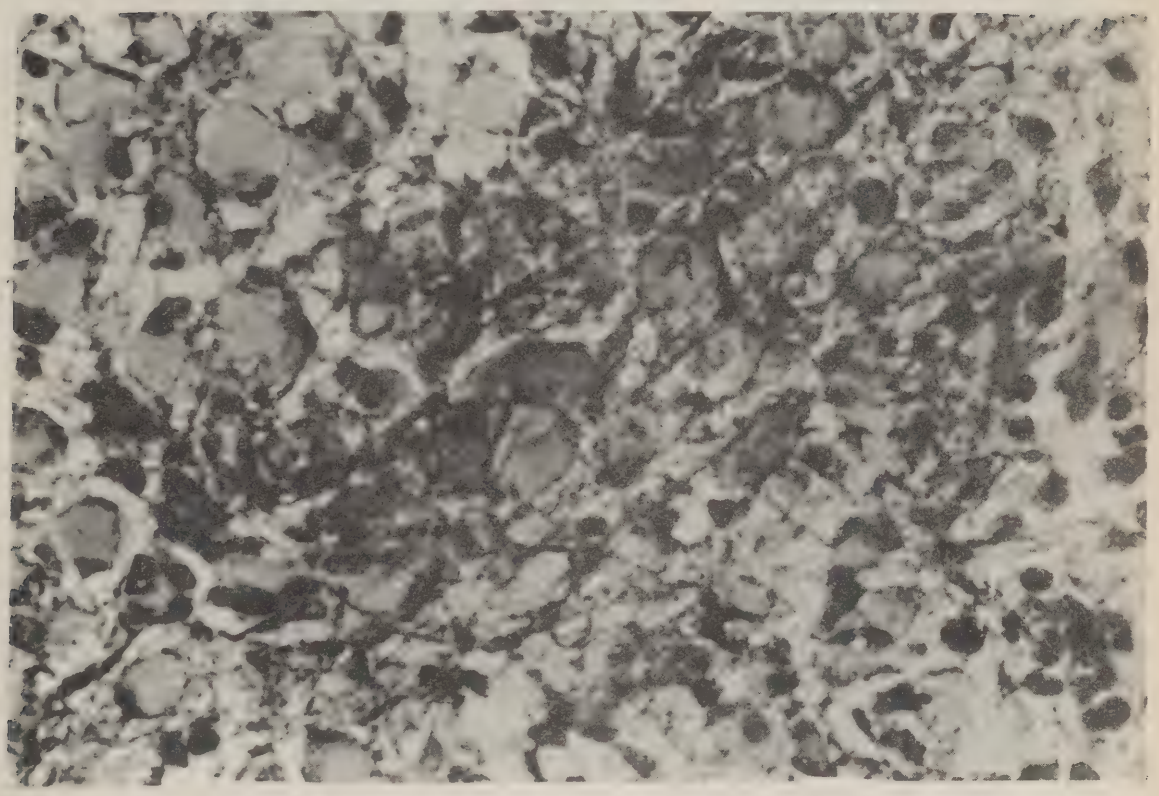
Microscopic: The predominating cells are Nissl's plump astrocytes (A). The nuclei are eccentric and the enlarged cell body is filled with homogeneous cytoplasm. Multinucleated giant astrocytes (B) are also noted. The neuroglial fibers (C) are coarse and scanty. (The word "gemistocytic" used to describe this tumor is derived from the Greek adjective gemistos which means "filled up".)

Scattered cells of this type may occur in other pathologic lesions but in this case they are seen in neoplastic proliferation as the predominant cells.

These tumors are always located in the cerebrum; cyst formation is not a feature; they offer a somewhat poorer prognosis than pilocytic tumors because of their tendency to recur.

Slide 23B

ASTROCYTOMA, GEMISTOCYTIC TYPE ACC. 80843-B



NEG. 73033 X515

Accession 80843-C

Registered by
The Montreal Neurological Inst.
Montreal, Canada.

ASTROCYTOMA DIFFUSUM

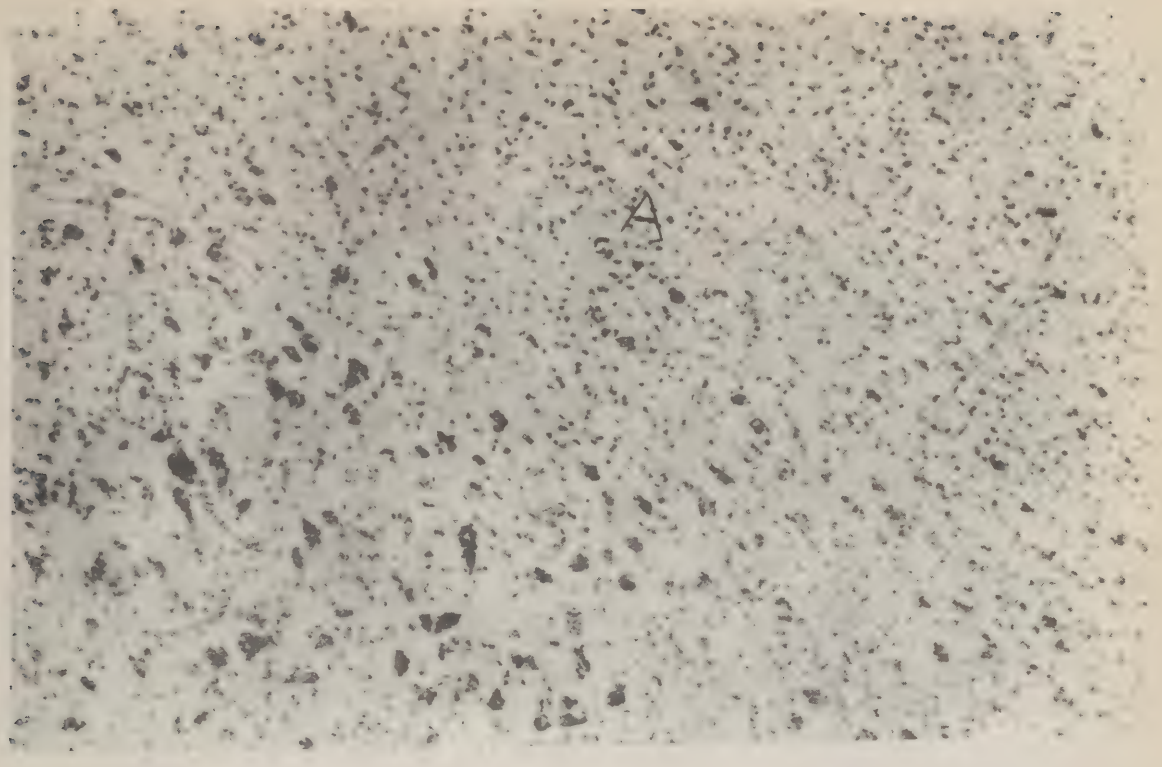
Clinical Note: White male, age 37 years. Five-year history of headache; also diminished visual and auditory acuity for several years. Although the clinical findings suggested tumor, there was no definite evidence afforded by encephalography or electrographic studies. At operation tumor was found replacing the right frontal lobe and corpus collosum. A right frontal lobectomy was done followed by intensive deep X-ray therapy.

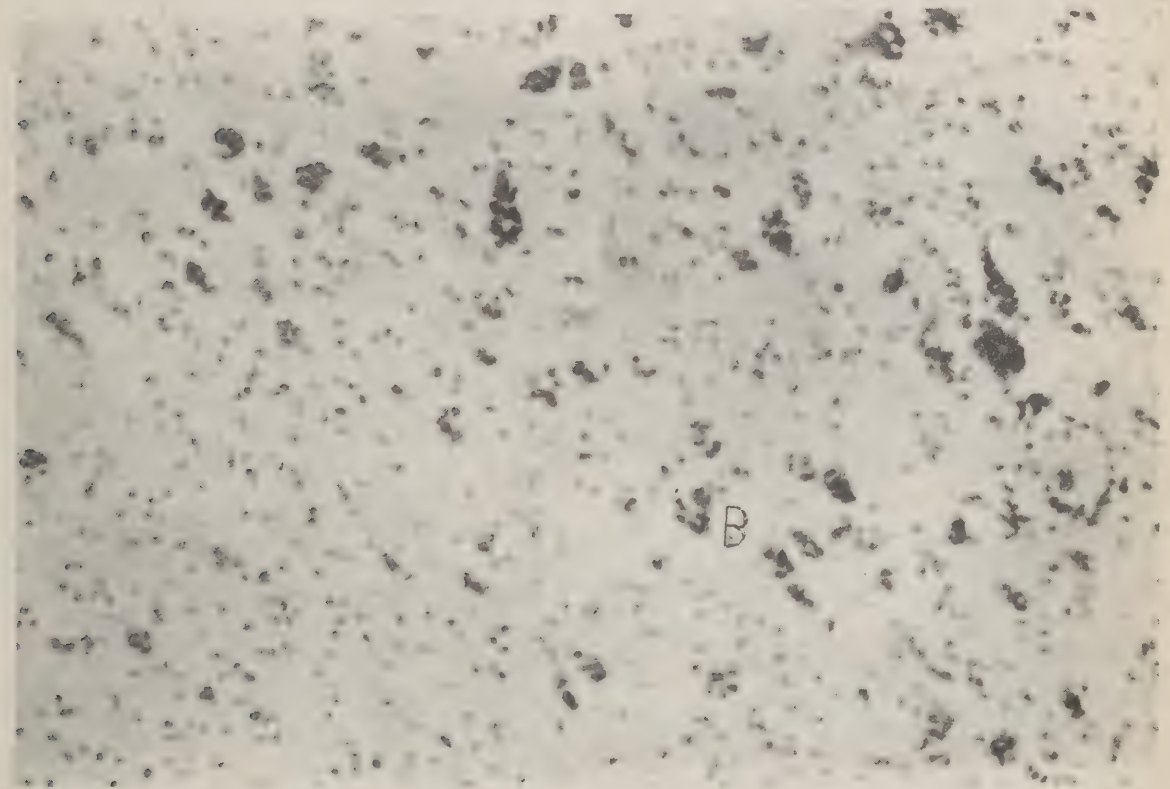
Microscopic: Note the poor demarcation and diffuse scattering of uniform round cells (A). The striking perineuronal satellitosis (B) is characteristic. With silver stains the round cells are found to be astrocytes. Ganglion cells are frequently imbedded in these tumors, displaced away from the gray matter as a result of expansion and pull of the tumor tissue. This case is similar to Accession 59623, slides 22 and 23.

These tumors are located in the cerebrum; cyst formation is not a feature; the prognosis is the least favorable of the group because of the great difficulty of the neurosurgeon to determine the frontier of the tumor.

Slide 23C

ASTROCYTOMA DIFFUSUM ACC. 80843-C





NEG. 73034 X150

NEG. 73031 X240

Accession 73944
(2 slides)

Registered by
Walter Reed General Hosp.,
Washington, D.C.

OLIGODENDROGLIOMA

Clinical Note: White male, age 21. Symptoms were of ten months' duration beginning with "weakness of legs" and vertigo followed later by headache. Progressive lethargy was noted. Craniotomy with subtemporal decompression was done and neoplastic tissue was found on the basal surface of the right frontal lobe in relationship with the right optic nerve. Removal of this tumor was not attempted and the patient died two days later.

Path. Gross: All ventricles were dilated and largely filled with a soft homogeneous tumor mass. The point of origin was thought to be the left parietal region.

Microscopic: This tumor is densely cellular and of a very uniform nature (A). Islets of calcium (corpora arenacea) (B) are seen at the fringes of the tumor. The nuclei (C) are round and contain a heavy chromatin network. The cytoplasm (D) is swollen and vacuolated and stains with difficulty. The thionin stain brings out the nuclear morphology but the cytoplasm appears as a halo. The connective tissue stroma is scanty.

Age Group: Average age 37.5 years. Elvidge, Penfield and Cone (1937)

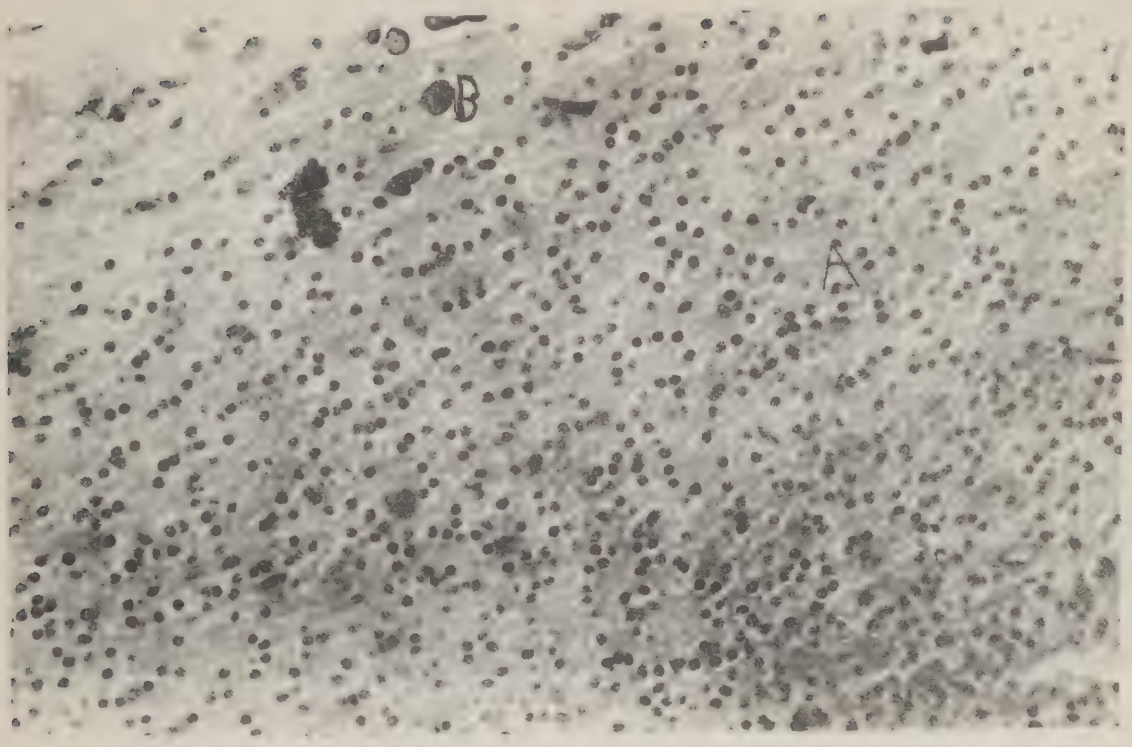
Location: Cerebral hemispheres.

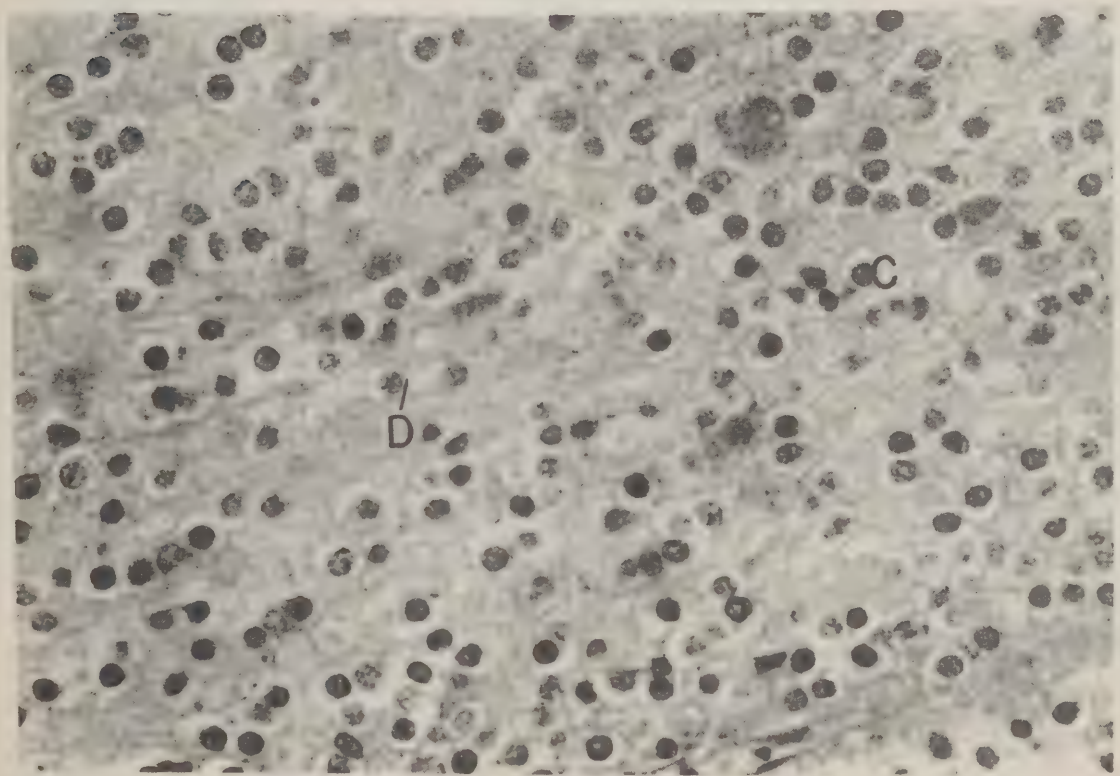
Average Pre-Admission Duration of Symptoms: About 12 years. Elvidge, Penfield and Cone (1937)

Operability: A benign and slow-growing tumor but in the number of cases that have been reported, the post-operative results have been disappointing. This probably is because of the large size they attain in slow growth before symptoms are produced. This tumor is often revealed in flat x-ray film by its calcification.

Slides 24 and 25

OLIGODENDROGLIOMA ACC. 73944





NEG. 72270 X240

NEG. 72271 X560

Accession 77974

Registered by
Army Medical Museum
Washington, D.C.

PAPILLOMA, CHORIOID PLEXUS

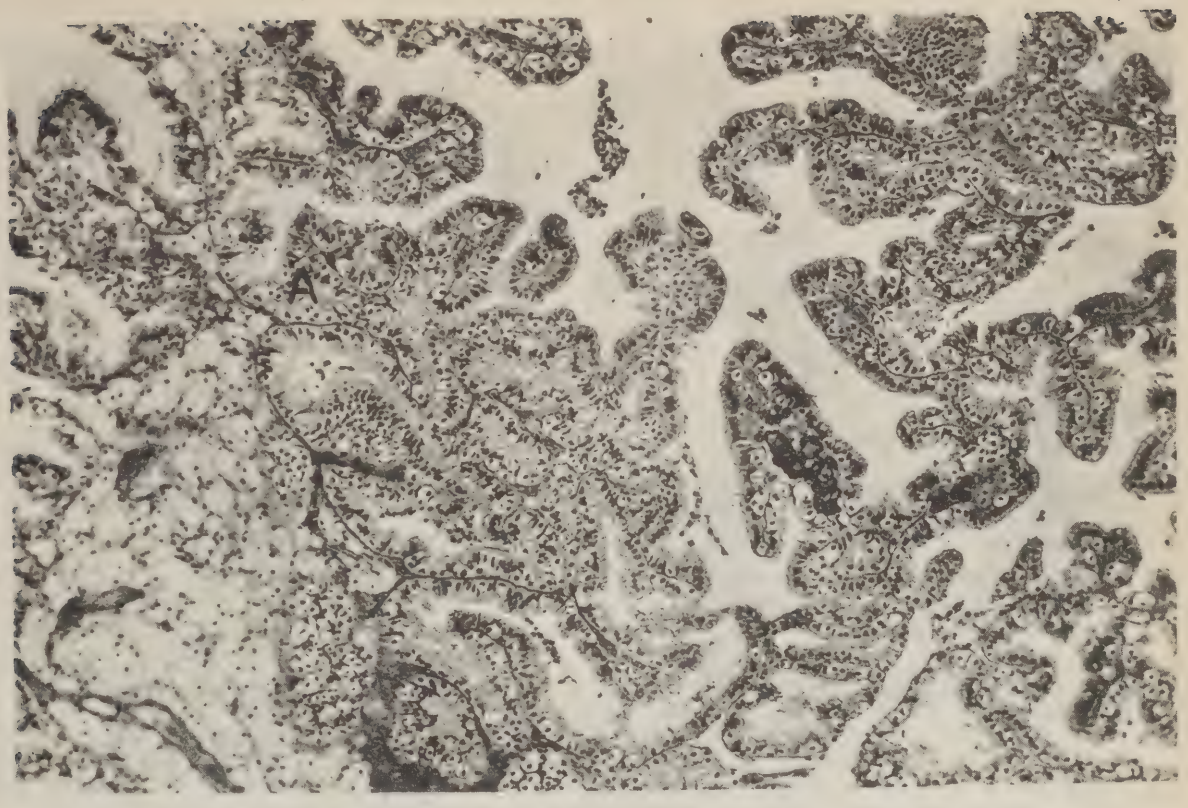
Clinical Note: White male, age 26. Onset of diplopia abruptly June 1941. Frequent dizzy spells and general lassitude. Papilledema was fairly marked. Electroencephalogram showed a constant abnormal record and gave the impression that pathology lay in left premotor area. Ventriculogram studies, August 1941, suggested posterior fossa tumor, possibly midline cerebellar. Suboccipital craniotomy exposed a large tumor protruding in midline just inferior to cerebellar lobes. It was considered inoperable and biopsy only removed.

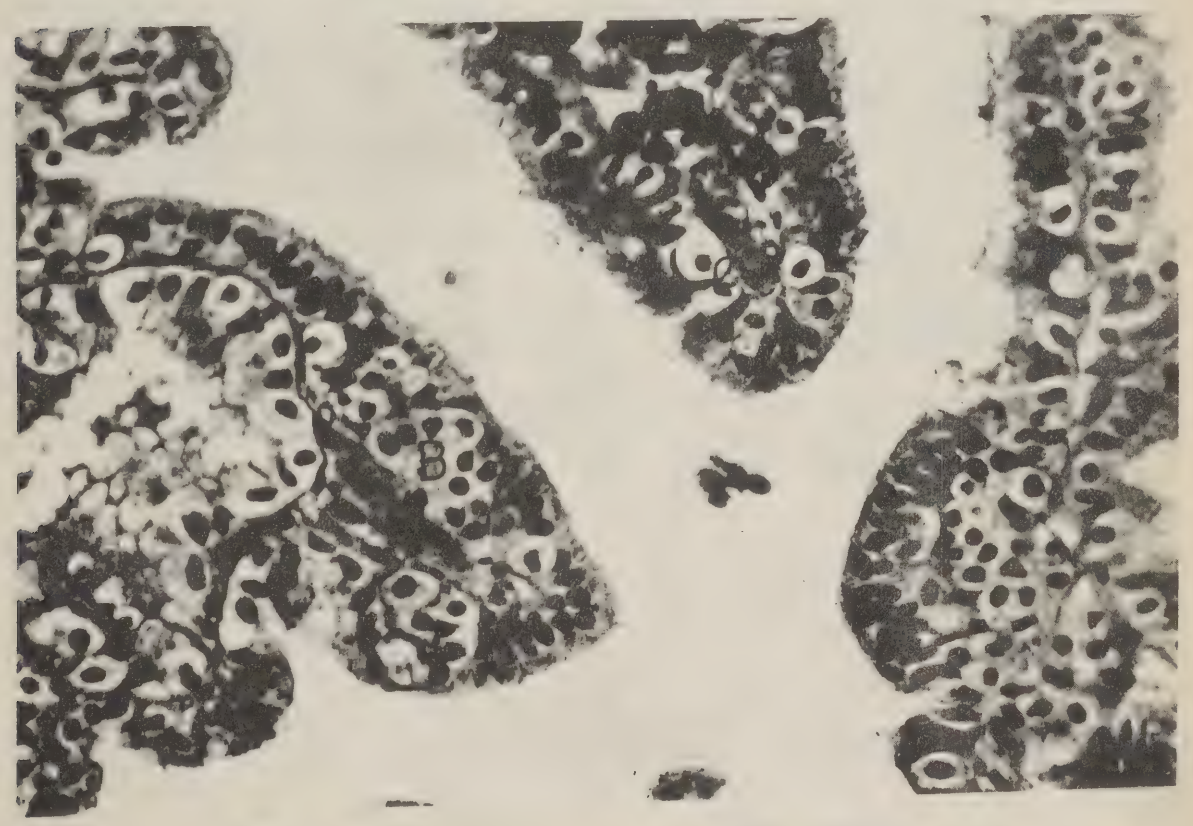
Path. Gross: An ovoid 2 x 1.5 cm. piece of hemorrhagic tissue with strands of fibrous tissue.

Microscopic: A distinctly papillomatous tumor is seen which resembles the normal chorioid plexus. The core is made up of loose connective tissue (A) and the pseudostratified epithelial lining cells (B) are high columnar. This is in contrast with the adult chorioid epithelium which is cuboidal. The vacuolization of the epithelial cells (C) is striking.

Kernohan (1937) believes that these vacuoles are filled with mucus and recommends this as a point in differentiating from myxopapillary ependymomas where it is said that mucus can usually be demonstrated in the connective tissue core only. This is an uncommon but benign and operable tumor. It is frequently calcified.

PAPILLOMA, CHORIOID PLEXUS ACC. 77974





NEG. 72667 X150

NEG. 72662 X515

Accession 61376

Registered by
Army Medical Museum
Washington, D.C.

CRANIOPHARYNGIOMA

Clinical Note: White male, age 50. No other clinical data. Patient found dead.

Path. Gross: A cystic tumor was found directly in front of the optic chiasma. It was yellow, soft and measured 4 x 3 cm. The meningeal covering had ruptured and a grumous material exuded from the cyst. There was slight burrowing into the base of the frontal lobe.

Microscopic: The cyst wall is found to be lined by squamous epithelium (A). There is sharp demarcation between tumor and brain substance (B). Degenerated keratin (C) is found within the cyst.

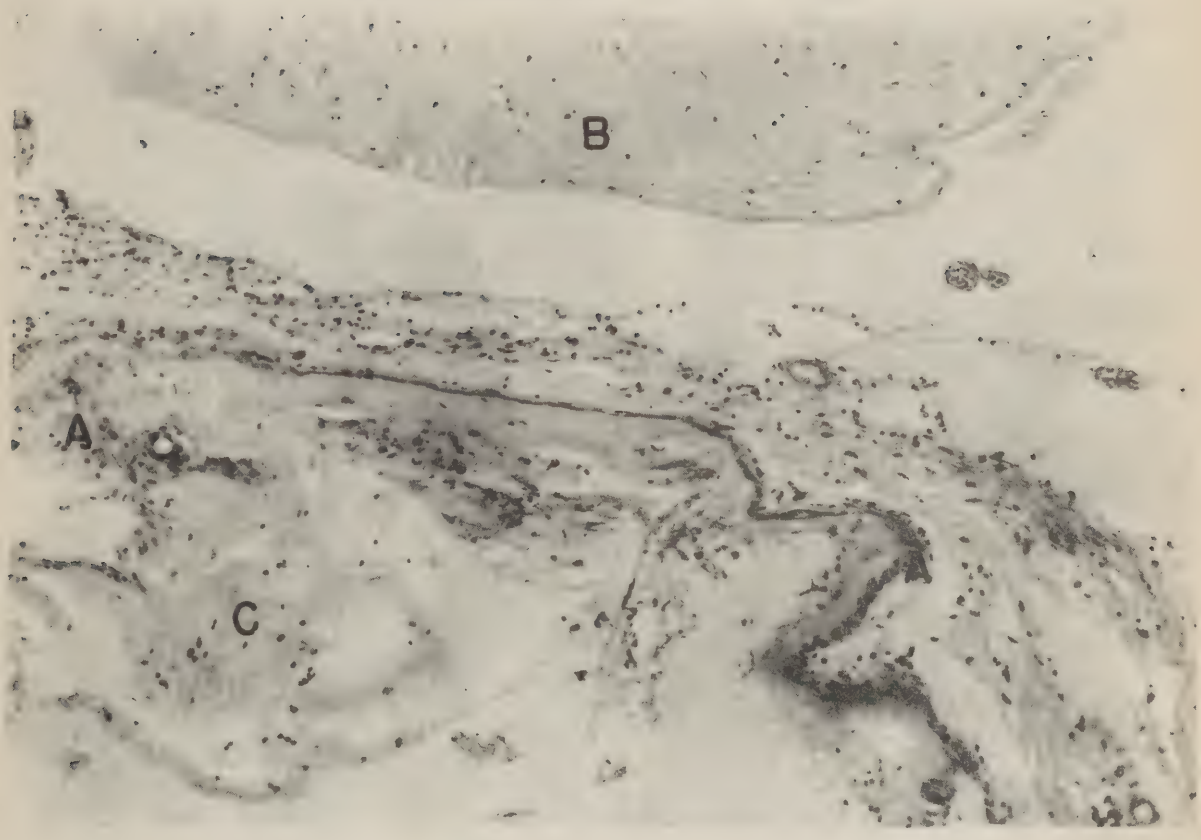
These are fairly common brain tumors and are derived from remnants of Rathke's pouch. Sometimes they are found to be adamantinomas. Synonyms are "supra-sellar tumor", "Rathke pouch tumor", "cholesteatoma".

Age Group: Highest incidence 10 to 15 years of age. Bailey (1933.)

Location: Within or above the sella turcica and often extending into the third ventricle.

Operability: Although a benign tumor, the removal is difficult due to surrounding structures and the post-operative morbidity and mortality are high. Bailey (1933)

CRANIOPHARYNGIOMA ACC. 61376



NEG. 72059 X150

Accession 67368

Registered by
Walter Reed General Hospital
Washington, D.C.

PERINEURAL FIBROBLASTOMA
(8TH NERVE TUMOR)

Clinical Note: White male, age 49. Two-year history of spells of dizziness, headache and gradual loss of hearing in the right ear. Three attacks of projectile vomiting; increasingly poor vision; staggering and severe headaches. Patient died during removal of tumor.

Path. Gross: A large, reddish-brown, lobulated tumor mass, well-defined, measuring 3 x 2 x 1 inches in size was found in the right cerebello-pontile angle. The medulla was displaced to the left, the cerebellum compressed and there was marked hydrocephalus.

Microscopic: Collagen fibers of even calibre are seen and the parallel grouping is characteristic (B). The tendency to form interlacing bundles is to be noted and also large whorls may be identified in the slide. Streaming of the nuclei (A) is likewise characteristic. Verocay's palisading of nuclei is almost pathognomonic of this tumor. The type cell is the fibroblast originating from the perineurium. It is the most common cerebello-pontile angle tumor and peripheral nerve tumor. The central tumor and peripheal tumors may occur together as in von Recklinghausen's disease. In the latter nerve fibers may be seen in the tumor.

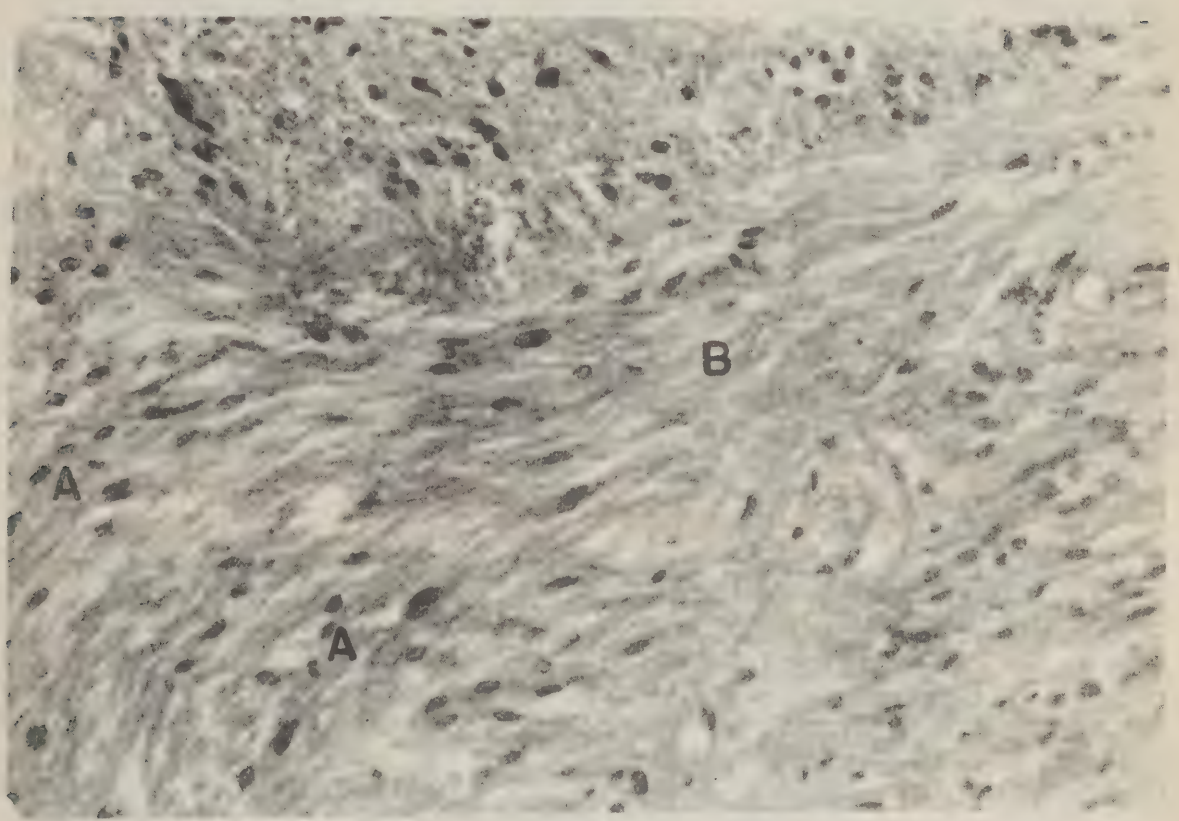
Age Group: Highest incidence 25 to 45 years of age. Bailey (1933)

Location: Cerebello-pontile angle in relationship with the acoustic nerve.

Operability: Difficult technical procedure but if removal can be accomplished the prognosis is excellent.

Slide 28

PERINEURAL FIBROBLASTOMA (8TH NERVE TUMOR) ACC. 67368



NEG. 72060 X320

Accession 65044

Registered by
Veterans' Administration
Washington, D.C.

CHOLESTEATOMA

Clinical Note: White male, age 49. Questionable sixteen-year history of "loss of equilibrium". Definite fourteen-year history of severe vertigo necessitating conscious effort in walking. He was unable to focus vision. Prior to death the patient developed definite cerebellar signs. The clinical diagnosis was encephalitis.

Path. Gross; A large cystic tumor mass was found lying within and filling a greatly dilated fourth ventricle. The tumor was imbedded in the cerebellum but not infiltrating. The surface was smooth and had a pearly sheen.

Microscopic: Compressed cerebellar tissue (A) and cyst wall (B) are seen. The lining of the cyst is stratified squamous epithelium still evident in some areas (C). A keratin nest (D) is noted suggesting the "pearl" of epidermoid carcinoma. Note the heavy deposit of keratin (E).

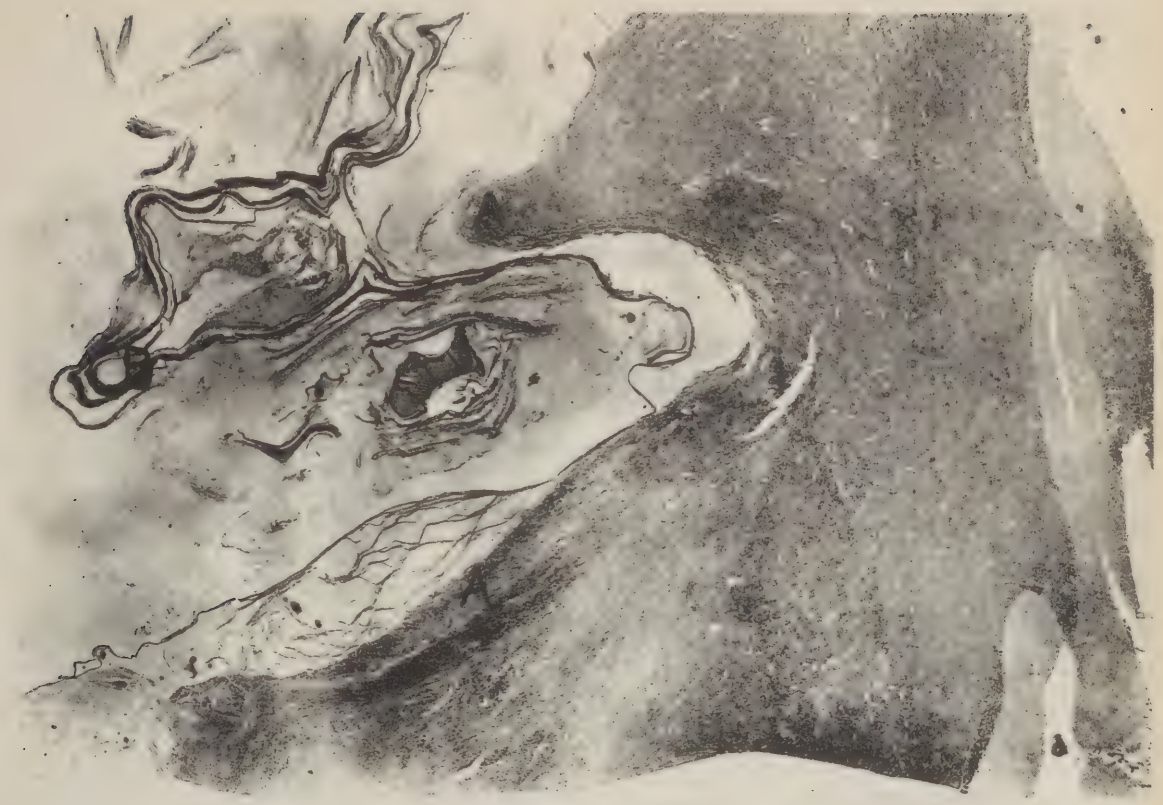
This is an uncommon tumor of the brain and probably arises from embryonal epithelial implants.(Rathke's pouch) This particular tumor would be more properly called "epidermal cyst" because there is little if any cholesterin. The debris filling it is remains of keratinized squamous epithelium.

Age Group: Onset of symptoms usually in adult life and more often an accidental autopsy finding.

Location: Subarachnoid space. Also extradurally within the middle ear or temporal bone. Most commonly in the pituitary or along the path of Rathke's pouch.

Operability: A benign tumor readily removed if location permits.

CHOLESTEATOMA ACC. 65044



NEG. 72062 X24 NEG. 72061 X90

Accession 75920
(2 slides)

Registered by
Walter Reed General Hospital,
Washington. D.C.

MENINGEAL FIBROBLASTOMA

Clinical Note: White male, age 32. Mental symptoms of six months' duration. About three months from the onset of symptoms there was a sudden episode of coma and signs of marked intracranial pressure. Emergency decompression was followed by marked improvement. Right frontal craniotomy was done at a later date with removal of an encapsulated tumor. Post-operative course was uneventful.

Path. Gross: An encapsulated firm, reddish-purple neoplastic mass was found attached to the dura, eroding the bone and imbedded in the substance of the right frontal lobe.

Microscopic: The definite pattern of fibroblastic "whorls" is striking (A). Many of these are about blood vessels (B). Nuclei of fibroblasts cut transversely (C) and streaming fibroglia fibrils (D) are typical. In the P A H stain, note with the high power the delicate fibrils of the fibroblasts. It is interesting to compare this section with the glia fibrils seen in the astrocytoma section (Accession 59623). In the more undifferentiated types this tumor has a much more varied architecture and hence the confusing nomenclature that has arisen in the literature; i.e., psammoma, endothelioma, meningoblastoma, etc. These tumors probably all represent variations of the meningeal fibroblastoma. Eburnation and thickening of bone overlying the tumor is quite common.

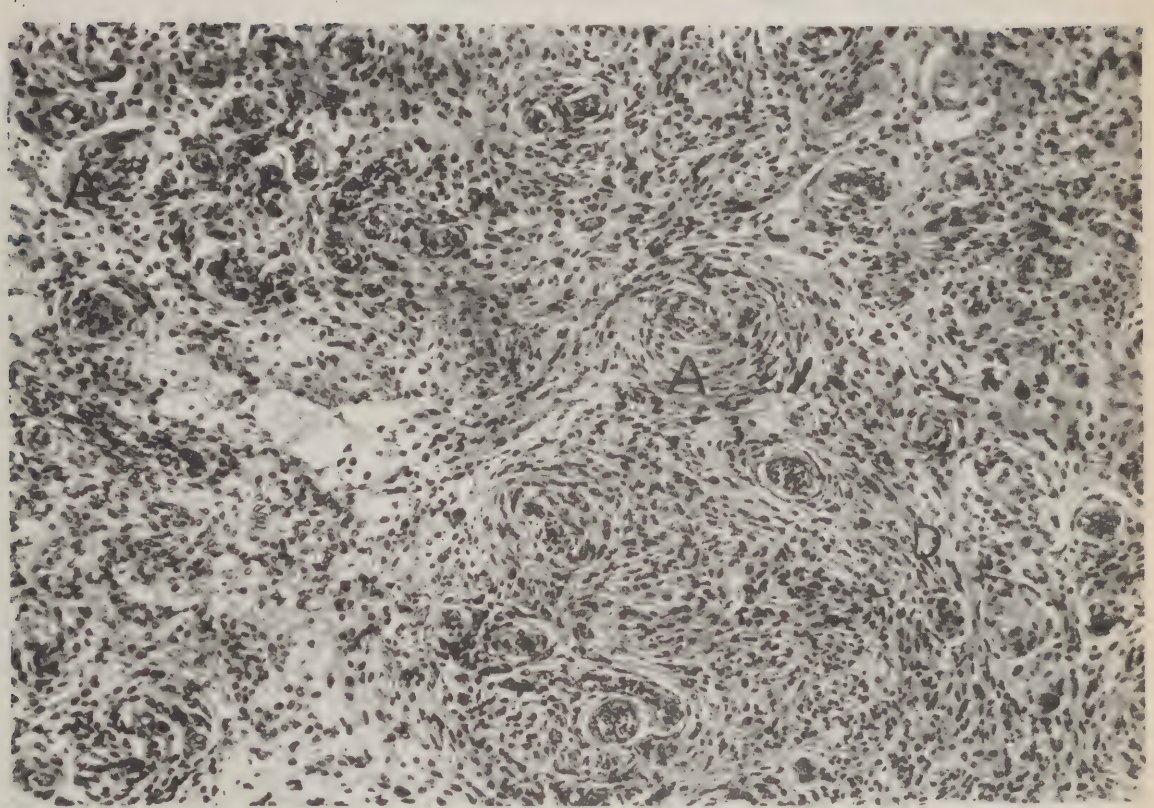
Age Group: Fourth decade.

Location: Over the dorsum of the cerebral hemispheres or the base. There is a marked tendency to erode bone, occasionally extending into orbit and accessory sinuses.

Operability: A benign tumor but oftentimes removal is difficult because of bleeding. If removal is satisfactory, the prognosis is excellent as brain substance is usually compressed and not invaded. The blood supply is often from external carotid as shown by arteriogram. Rarely are these tumors malignant.

Slides 30 and 31

MENINGEAL FIBROBLASTOMA ACC. 75920



NEG. 72144 X160

(50)

Accession 67091
(2 slides)

Registered by
Dr. George Stimson
Warren, Ohio

MENINGEAL FIBROBLASTOMA OF ORBIT

Clinical Note: White male, age 43. Three-and-one-half-year history of proptosis of right eye associated with increasingly poor vision. The orbit was entirely exenterated and a tumor mass was found which filled the orbit. The post-operative course was uneventful.*

Path. Gross: A semi-soft, reddish-brown mass which completely filled the orbit. No communication with the intracranial cavity was seen and there was no evidence of intracranial tumor.

Microscopic: The close relationship of this tumor to the other case of meningeal fibroblastoma is readily seen. The cells, however, are not so definitely fibroblastic but more robust, richer in cytoplasm and having oval nuclei. The "whorl" arrangement is quite characteristic. This is the type that has been called "endothelioma of the dura". The point of origin is not definite, but it is included to emphasize that there is a tendency for the meningeal fibroblastoma to erode outward from the brain presenting oftentimes in most surprising locations. This case may represent a meningioma arising from the optic nerve sheath. The fragments of other tissue on the slide are accidental contaminants.

*Reference: Ohio State Med. Journ. 1941: 37, 451.

Slides 32 and 33

MENINGEAL FIBROBLASTOMA OF ORBIT ACC. 67091

NEG. 72123 X135

Accession 68378

Registered by
Army Medical Museum
Washington D.C.

OSTEOGENIC MENINGIOMA

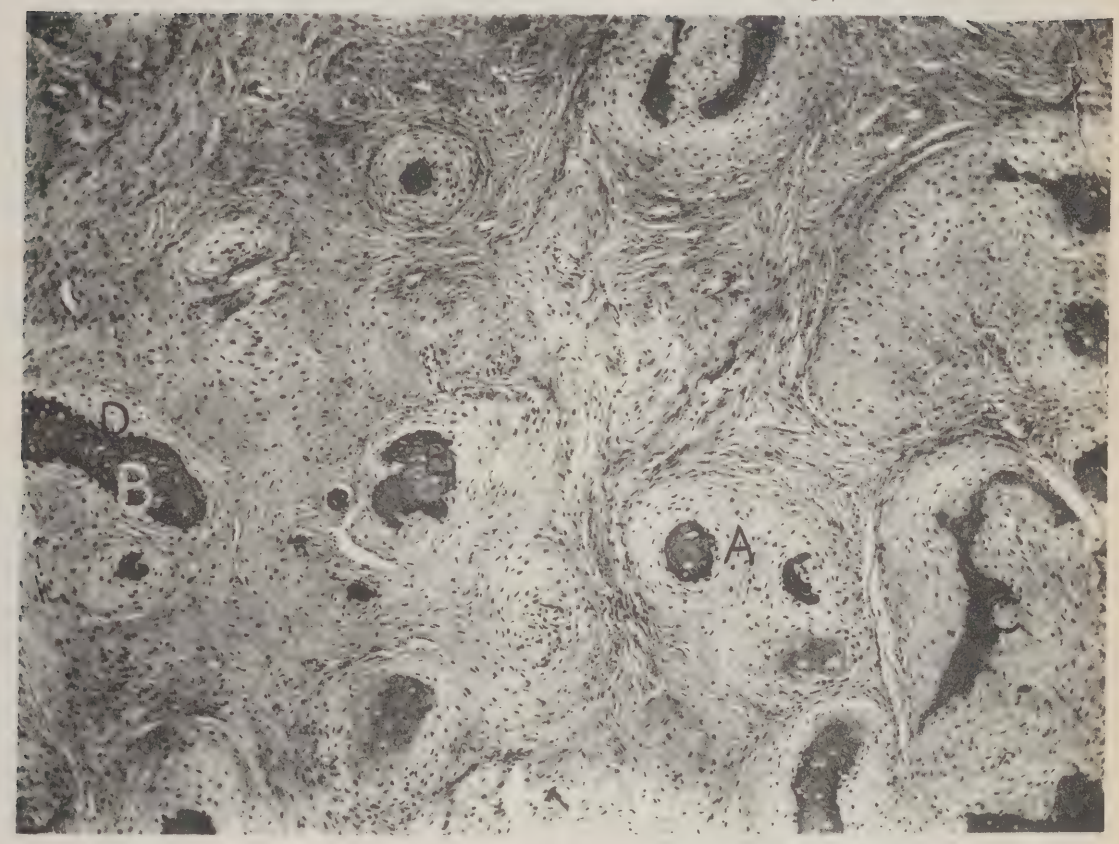
Clinical Note: White male, age 25. The history is fragmentary and suggests that tumor symptoms were masked by neuro-syphilis. This unfortunately is not too uncommon. Autopsy specimen.

Path. Gross: There was located in the anterior left frontal lobe a lobulated, firm, grayish-white tumor mass, not attached to brain substance but pushing it aside. There was light attachment to the bone of the anterior fossa.

Microscopic: Note the many "whorls" of fibroblastic tissue (A) with islands of bone (B) in their centers. In the slide, coarse collagenous fibrils are seen at the periphery of the whorls, while toward the center the matrix is more embryonal in type. Note the new bone spicules (C) outlined by osteoblasts (D). Osteocytes (E) imbedded in the spicules are found. This represents neoplastic membranous bone formation.=osteoid tissue.

Slide 34

OSTEOGENIC MENINGIOMA ACC. 68378



NEG. 72125 X95

Accession 79598
(2 slides)

Registered by
Army Medical Museum
Washington, D.C.

MENINGEAL FIBROBLASTOMA

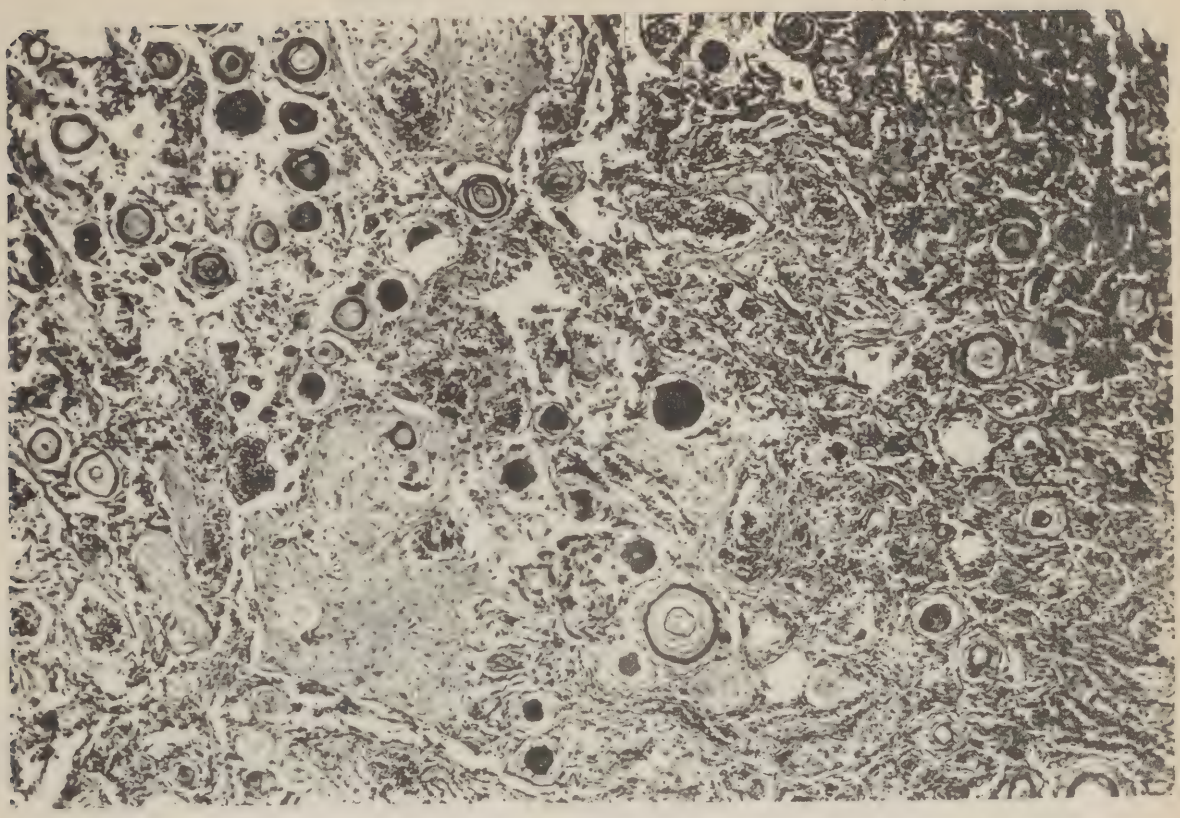
Clinical Note: White male, age 23. Eight-month history of progressive spastic paralysis of both lower extremities followed by difficulty in voiding. Patient could walk only by holding on to stationary objects. Neurologic focalizing signs pointed toward tumor in the mid-dorsal region. Laminectomy was done and a firm extradural reddish mass was found at D5. This tumor was ½ inch thick and approximately 3 inches long. Extending into the intervertebral foramen the mass encompassed the posterior nerve root. It was also found that a tumor almost as large as that outside the dura was growing inside the dura and severely compressing the cord. The neoplasm was wiped away, sacrificing the posterior root.

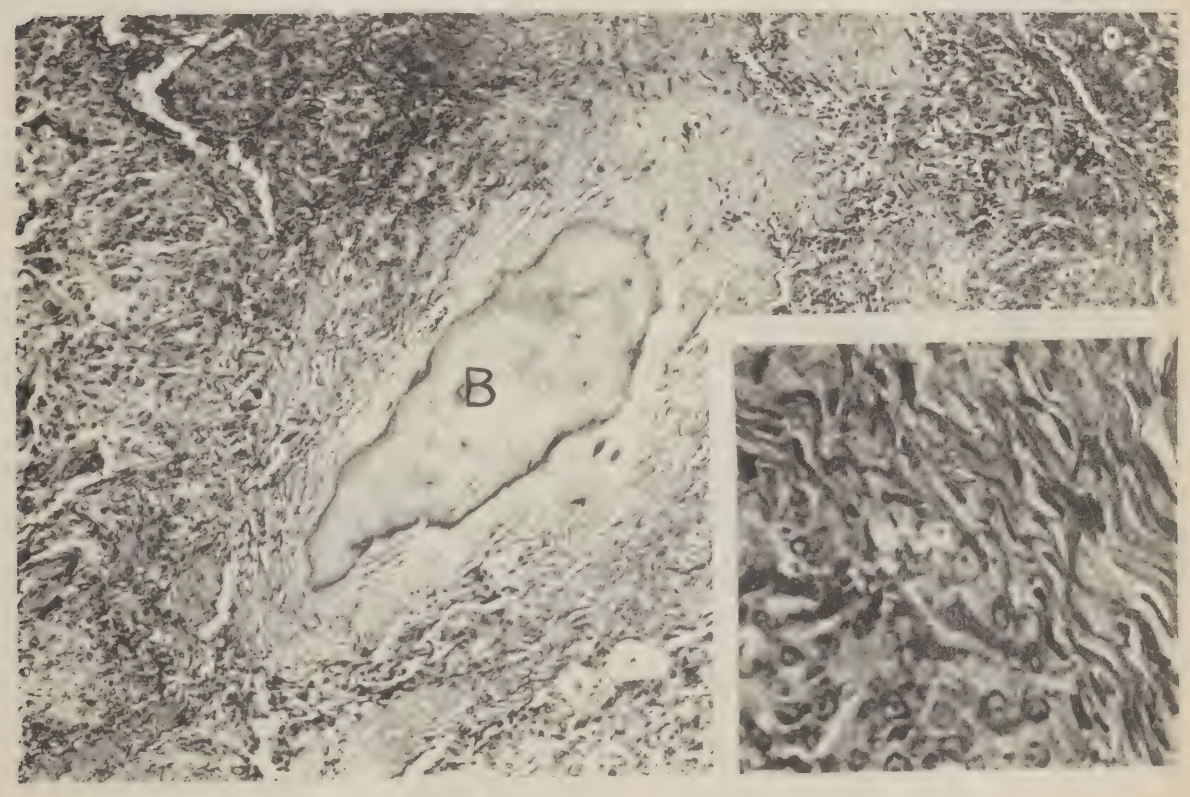
Path. Gross: Several fragments of irregular, ragged yellowish to reddish-brown tissue. On section these fragments were moderately firm, rather opaque and slightly granular.

Microscopic: This case is to be compared with Accession 75920 (slides 30 and 31). It shows the characteristic features of these tumors as they present in the spinal cord, namely the great number of corpora arenacea and adult type of fibroblastic tissue. These features are probably manifestations of slow growth. The infiltration of the nerve root (A) seen in the section is interesting, as is the invasion of bone (B) with elevation of the periosteum and eburnation of the invaded bone.

Slides 34A and 34B

MENINGEAL FIBROBLASTOMA ACC. 79598





NEG. 72918 X100 NEG. 72919 X150 NEG. 72921 X515

Accession 79347

Registered by
Dr. Walter Freeman
Washington, D.C.

HEMANGIOBLASTOMA

Clinical Note: White male, age 23. Severe headaches for three years. The headaches increased in severity and were associated with vomiting, dizziness, staggering and a tendency to fall to the left. The objective findings and the ventriculogram studies localized the neoplasm in the cerebellum. A suboccipital craniotomy was done and a 5 x 5 cm. tumor mass found in the fourth ventricle and attached to the cerebellum. The tumor was partially removed. Post-operatively the patient received intensive x-ray therapy with considerable clinical improvement. A second operation is contemplated.

Path. Gross: The surface of the tumor mass was gray but when cut into it was quite vascular and considerable operative bleeding was encountered.

Microscopic: The tumor is composed of many capillaries, some of which are dilated to form cavernous structures (A). The stroma in some areas (B) is very delicate and edematous and the blood spaces are loosely held together. However, in other areas the vessels are separated by cellular tissue (C) composed of endothelial cells and collagen fibers. The hyalinized thrombi (D) are manifestations of degenerative changes. Neoplastic cells filled with lipoid granules are often seen in this tumor but not in this case.

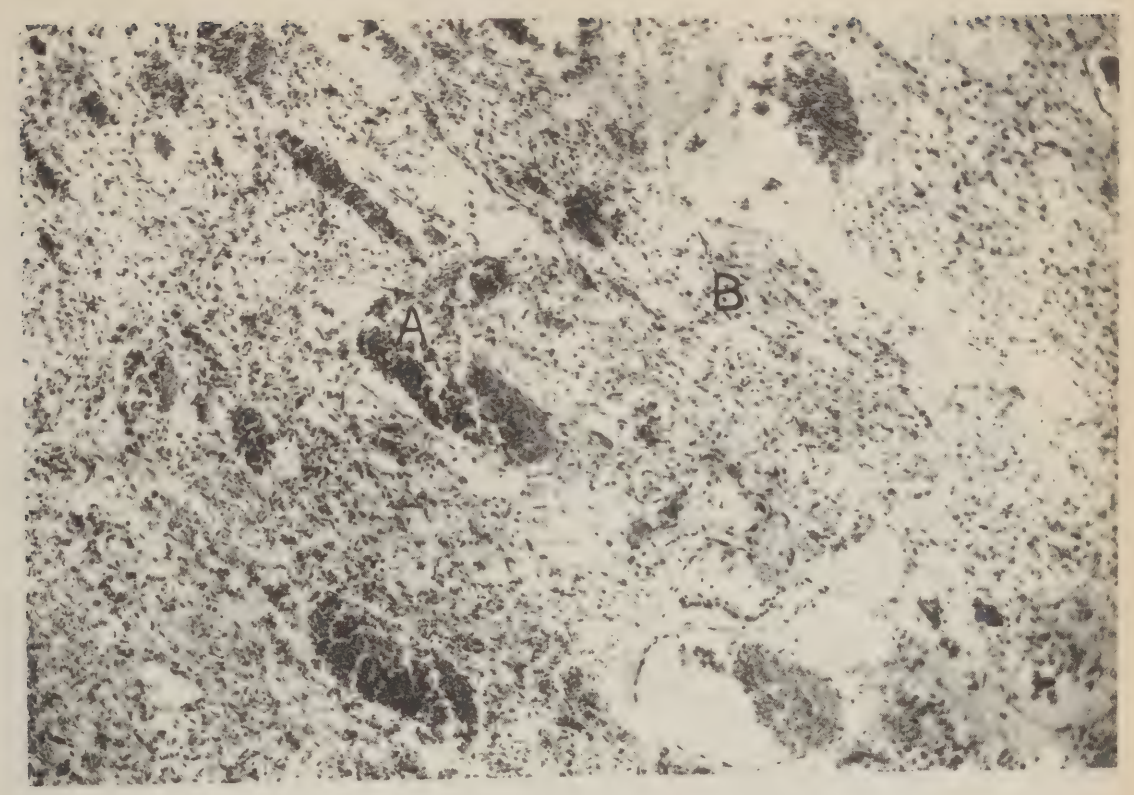
The more cellular area represents an increase in stroma suggestive of sclerosis as described by Bailey and Ford (1942) and thought to be, in general, a manifestation of regression but not quiescence. The meningeal tumor, angioblastic meningioma, is fundamentally the same tumor as the hemangioblastoma, the difference being essentially one of location.

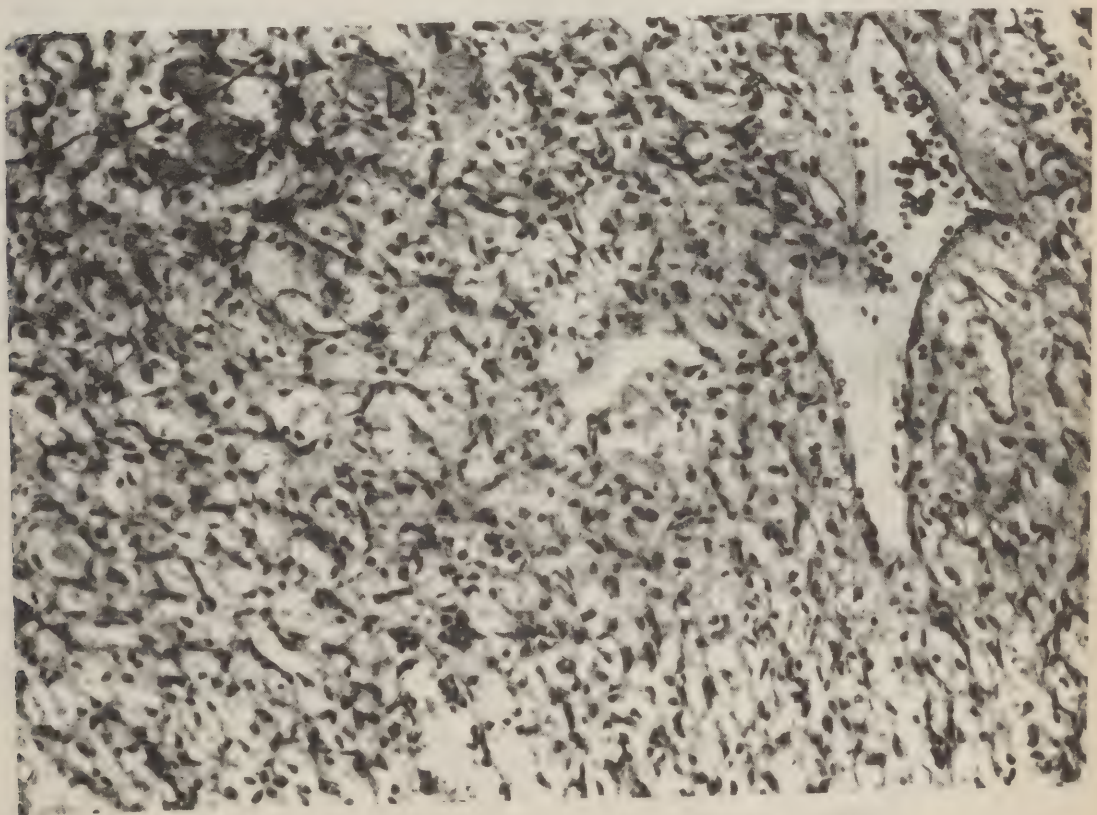
Age Group: Third decade. Bailey (1933)

Location: Cerebellum. Often associated with angiomatosis of the retina, cavernoma of the liver and cystic pancreas. The multiple lesions form the hereditary pathological complex known as Lindau's disease.

Operability: Diagnosis is often facilitated by the finding of associated hemangiomas of the retina. It is a benign tumor and the prognosis is excellent if complete removal is accomplished. Not infrequently these tumors occur as cerebellar cysts in which case the mural hemangiomatous nodule must be located and removed. If the location contra-indicates complete removal, intensive x-ray therapy is indicated.

HEMANGIOBLASTOMA ACC. 79347





NEG. 72870 X130 NEG. 72869 X225

Accession 78681-A

Registered by
The Montreal Neurological Inst.
Montreal, Canada

MALIGNANT MELANOMA, PRIMARY

Clinical Note: White female, age 32. History of numbness and awkwardness of the left hand following paratyphoid fever in June 1939. In March 1940 the patient had symptomatology of a cerebro-vascular accident with recovery in 24 hours, leaving only clumsiness of the left hand as a residium. She was admitted to the hospital in February 1941 because of headache on coughing or straining. The headaches dated from the time of her cerebro-vascular accident. The positive clinical findings were minimal. Nine days after admission to the hospital there was a sudden bulbar death. **

Path. Gross: A mass 3 x 2.5 cm. in diameter was found to occupy almost the complete lower portion of the medulla and the area of transition into the cervical cord. Only a rim of nervous tissue surrounded the mass. On cut section the consistency was rather firm, with scattered soft areas. The tumor extended upward into a cylindrical hemorrhage and downward into a grayish hemorrhagic area in the first few segments of the cervical cord. The autopsy was complete but no other noteworthy findings were encountered.

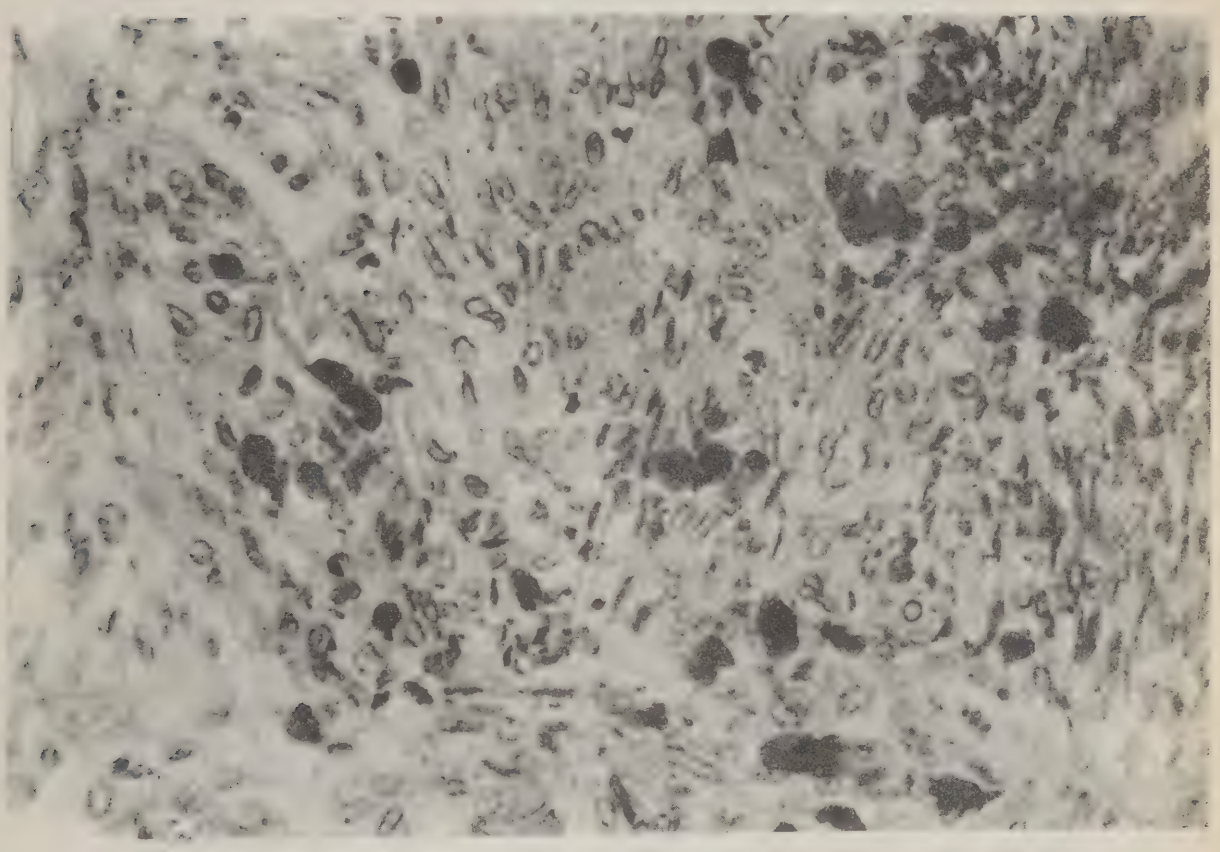
Microscopic: Examination with the hand lens shows tumor surrounded by a shell of tissue resembling spinal cord. Infiltration is evident. The tumor is densely cellular; spindle cells tend to arrange themselves in parallel streams but there is no definite pattern. The cells are cigar-shaped and there is considerable pleomorphism. The deposit of black pigment granules is striking. Some of the pigment is intracellular but for the most part it is deposited in large extracellular particles. Mallory's iron stain proved the pigment not to be hemosiderin and Fontana stain was characteristic for melanin pigment. This tumor more closely resembles the spindle-celled melanomas of the eye than those of the skin.

Occasional scattered chromatoblasts are found normally in the pia, particularly around the brain stem. These are probably the origin of this uncommon tumor.

*The stained slide was contributed by the Montreal Neurological Institute. Hematoxylin Van Gieson stain.

**Reference: Transactions of the American Neurological Society, June 9, 1941.

MALIGNANT MELANOMA, PRIMARY ACC. 78681-A



NEG. 72664 X600

Accession 78681-E

Registered by
The Montreal Neurological Inst.
Montreal, Canada*

BOECK'S SARCOID

Clinical Note: White male, age 31. Onset July 1940 of diminished visual and auditory acuity, headache, projectile vomiting and staggering gait. There was a 35 pound weight loss. In September 1940 an ulcer was removed from the upper lip. The pathologic report was chronic inflammatory process or granuloma. Biopsy taken from a sub-occipital craniotomy showed a chronic inflammatory process of the leptomeninges of the posterior fossa and of the cerebellum. Discharged on mercurial therapy with only temporary improvement. In February 1941 he was readmitted to the hospital with severe symptoms of increased intracranial tension and marked ataxia. Death occurred on March 25, 1941. The patient was serologically negative, the tuberculin test was negative, as was guinea pig inoculation.

Path. Gross: The cerebellum and inferior surface of the occipital lobes were bound to the dura by dense adhesions. Adhesions and a plastic exudate were found over the structures of the base. The brain weighed 1375 grams. The autopsy was restricted, but a small amount of lung tissue obtained showed a typical tuberculous lesion.

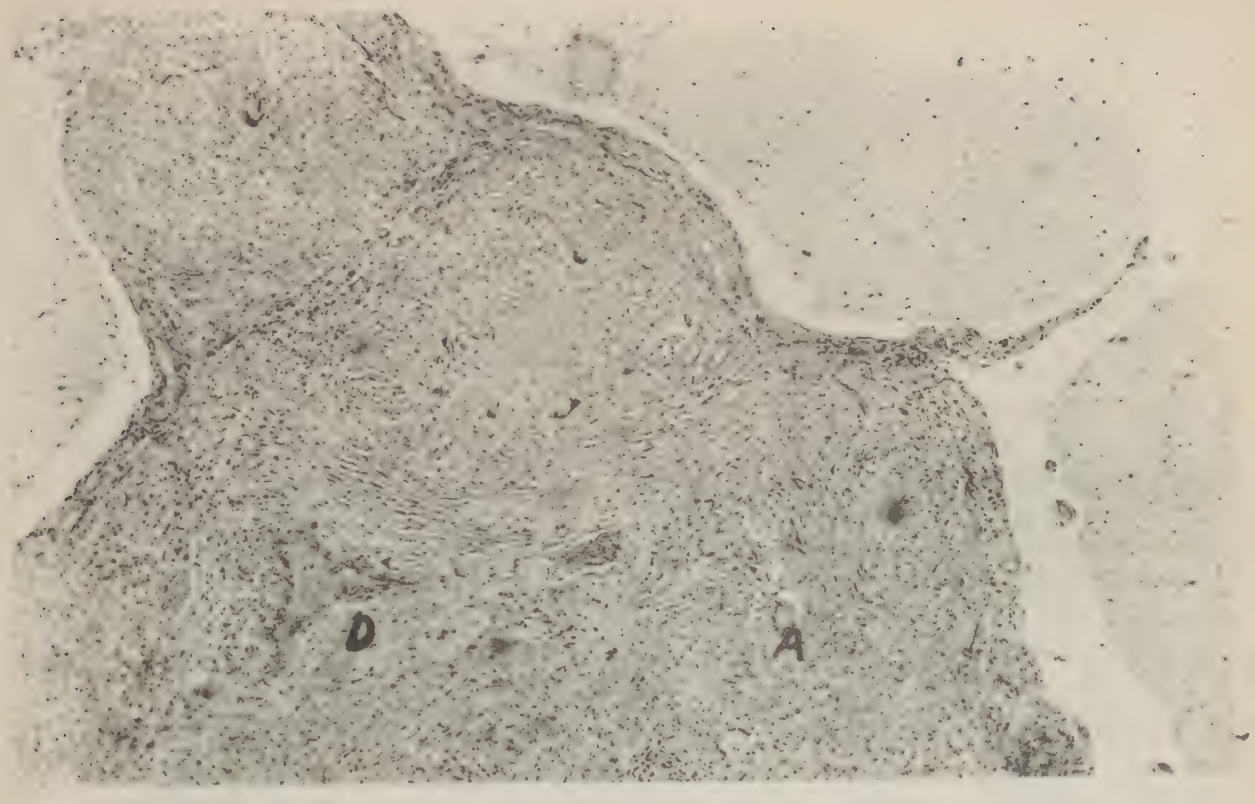
Microscopic: Multiple granulomata are seen characterized by Langhans' giant cells (A) and epithelioid cells (B). Note the scarcity of round cells (C) as compared with a tuberculous lesion. The absence of caseation necrosis is another characteristic in contrast with tuberculous lesions. Note the perivascular distribution (D). The granulomatous lesions are fairly well-circumscribed and are found within the brain parenchyma as well as in the meninges. Corpora arenacea are seen in the slide.

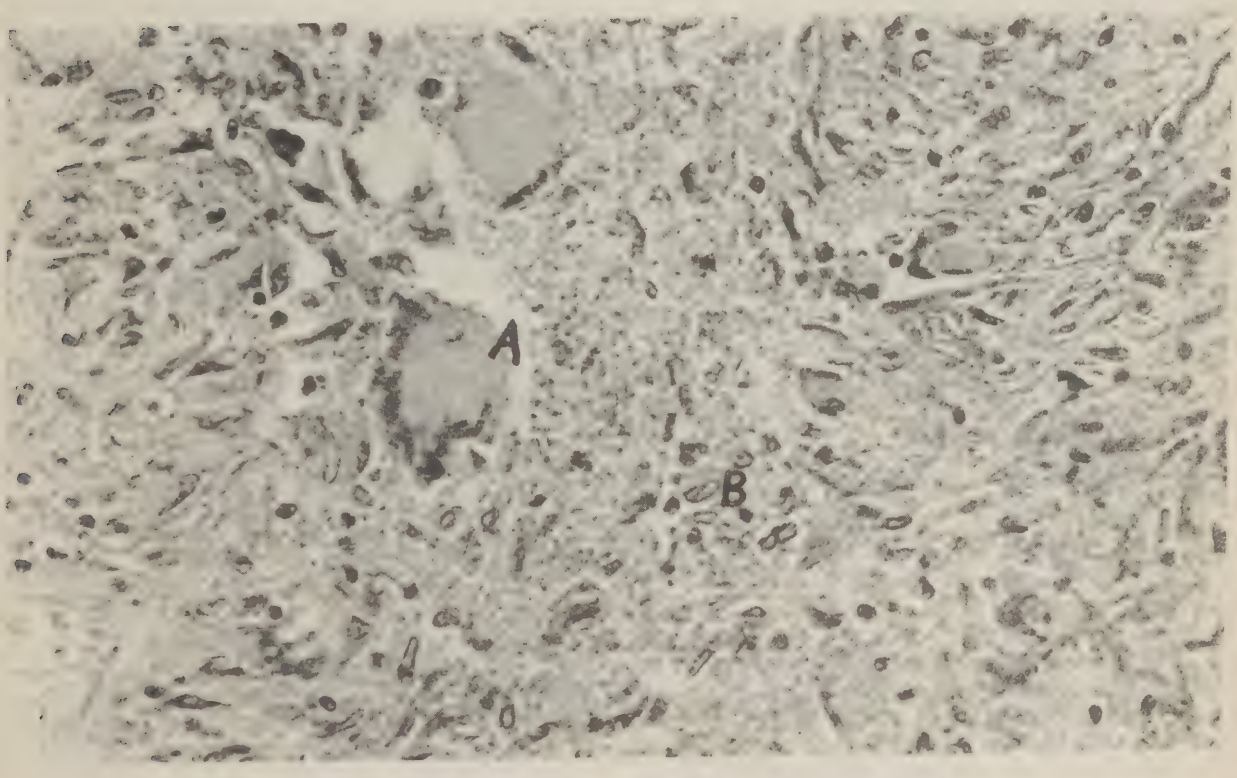
The etiology of this disease is unknown. It seems to be related to tuberculosis but this origin is still debatable. The location in this case is uncommon. The organs most frequently involved are skin and lymph nodes, but nearly every organ is subject to involvement including bones of the finger, parotid gland, spleen, lung, and liver. It is a chronic disease and recovery after a period of years is usual.

*The section was stained by the hematoxylin and Van Gieson method and was contributed by the Montreal Neurological Institute

Slide 37

BOECK'S SARCOID ACC. 78681-E





NEG. 72666 X475 NEG. 72660 X600

Accession 79346

Registered by
Dr. Walter Freeman
Washington, D.C.

TUBERCULOMA

Clinical Note: Colored female, age 2½. The clinical findings were those of miliary tuberculosis. She developed severe crying with headache and enlargement of the head was noted. Brain tumor was suspected. A thorotrast ventriculogram successfully outlined the ventricles. The ventricles were drained following the x-rays but the child died within 12 hours.

Path. Gross: A large, necrotic tuberculous mass was found in the left Sylvian region. Other tubercles were found in the white matter of the cerebrum and cerebellum. The tubercles had central areas which were granular and opaque-white surrounded by a peripheral zone of translucent grayish, somewhat softer tissue. The average size was a little over 1 cm. in diameter.

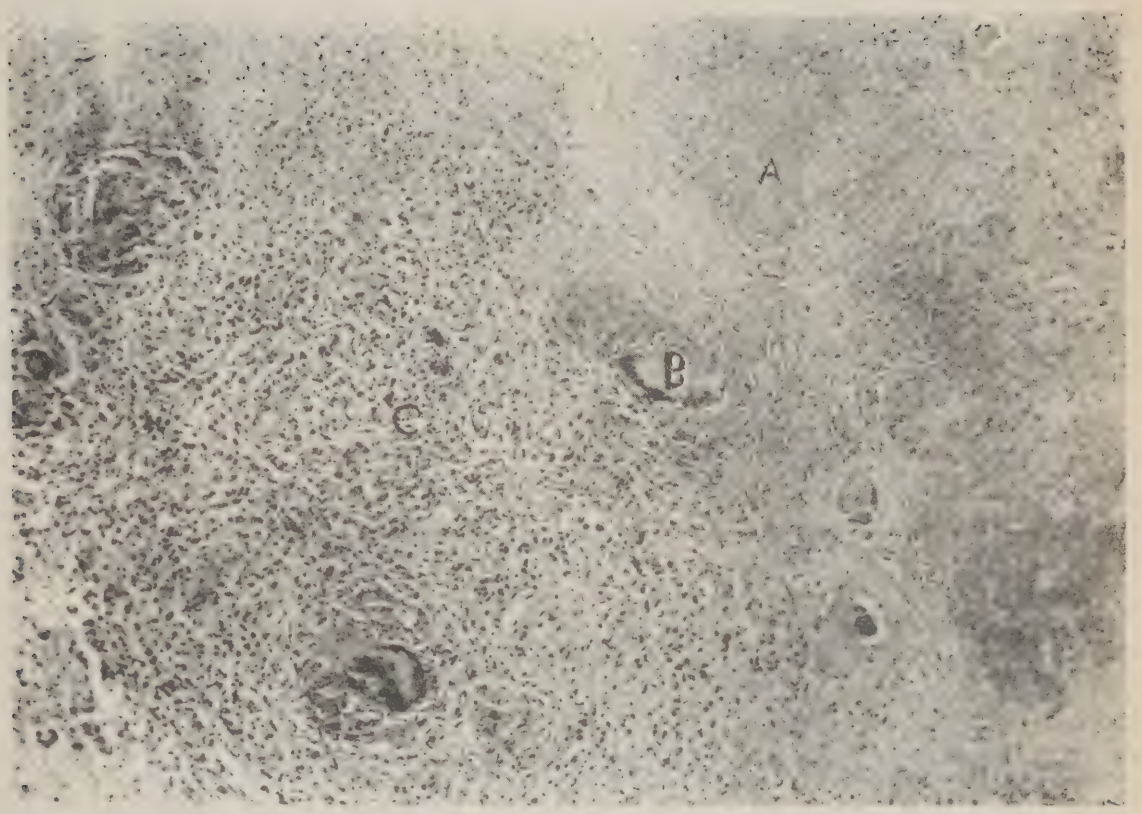
Microscopic: The features are caseation necrosis (A) surrounded by Langhans' giant cells (B), epithelioid cells (C) and an abundance of round cells (D). These features should be compared with Accession 78681-E (slide 37). Daughter tubercles seen in the slide indicate extension of the main caseous mass.

Tuberculosis causes two quite different lesions in the brain--tuberculoma and tuberculous meningitis. It is only the former that we are concerned with here because of its importance in differential diagnosis from neoplasm.

The incidence is dropping off with the incidence of general tuberculosis so that today it is a rather uncommon entity. Tuberculomata may be multiple or solitary and are associated with tuberculosis elsewhere in the body and often miliary tuberculosis. The diagnosis contra-indicates any attempt at removal because such an attempt is nearly always followed by tuberculous meningitis. Decompression may be indicated and the case then handled like one of general tuberculosis.

Slide 38

TUBERCULOMA ACC. 79346



NEG. 72872 X125

Accession 72476

Registered by
St. Elizabeth's Hospital,
Washington, D.C.

CYSTICERCUS CELLULOSA

Clinical Note: R.H., seaman, age 34 years. In 1927 he contracted syphilis for which he was given intensive treatment. In 1932 he had a severe convulsion and shortly following this he became extremely indifferent to his surroundings. Memory defects and intellectual enfeeblement were marked. A diagnosis of general paresis was made and therapeutic malaria given. However, his convulsions increased both in frequency and severity. Bilateral optic atrophy developed. Sphincter control was lost. Death occurred on January 14, 1941, following a series of violent convulsions and a terminal temperature of 108.8°.

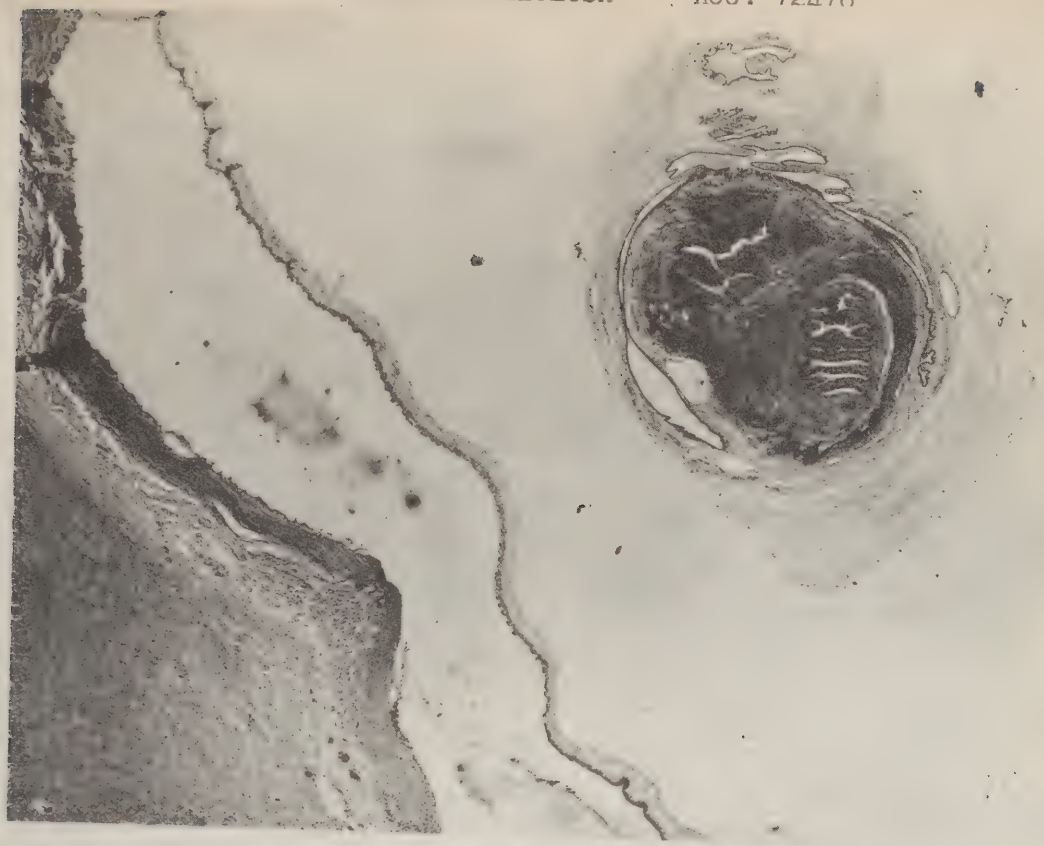
Path. Gross: The cerebral hemispheres were literally riddled with cysts varying in size from 5 to 12 mm. Many were calcified.

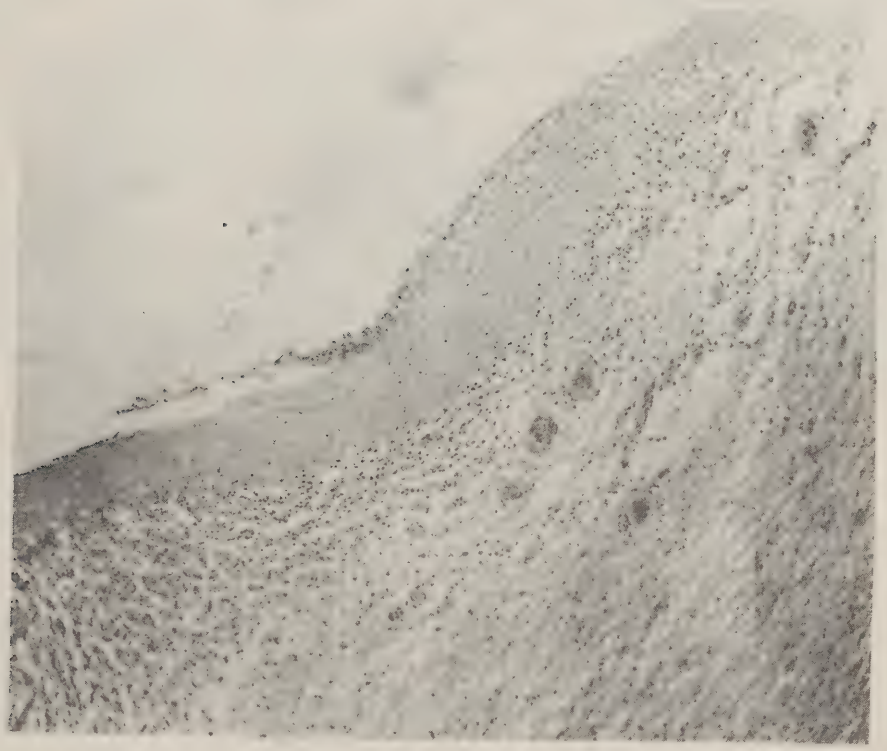
Microscopic: A section of cysticercus cellulosa is seen showing an invaginated scolex which is an identical miniature of the adult worm's head. The fibrous capsule surrounding the larva is characteristic. A chronic inflammatory reaction is seen in the brain tissue adjacent to the cyst.

This is the larval stage of the pork tapeworm. Man is infected through consumption of inadequately cooked pork. He develops cysticercosis as a result of swallowing cysti in "measly pork". or as a result of precocious hatching of eggs discharged by an adult worm which he harbors. The larvae penetrate the intestinal wall, pass through the blood stream or the lymph channels and are carried most commonly to the subcutaneous tissue and brain. Following the death of the larvae, characteristic cyst formation takes place.

This case is included to illustrate that all brain cysts are not necessarily neoplasms. Parasitic infestation of the brain while uncommon should be kept in mind.

CYSTICERCUS CELLULOSA ACC. 72476





NEG. 72878 X20 NEG. 72877 X80

(60)

Accession 56744

Registered by
Walter Reed General Hospital
Washington, D.C.

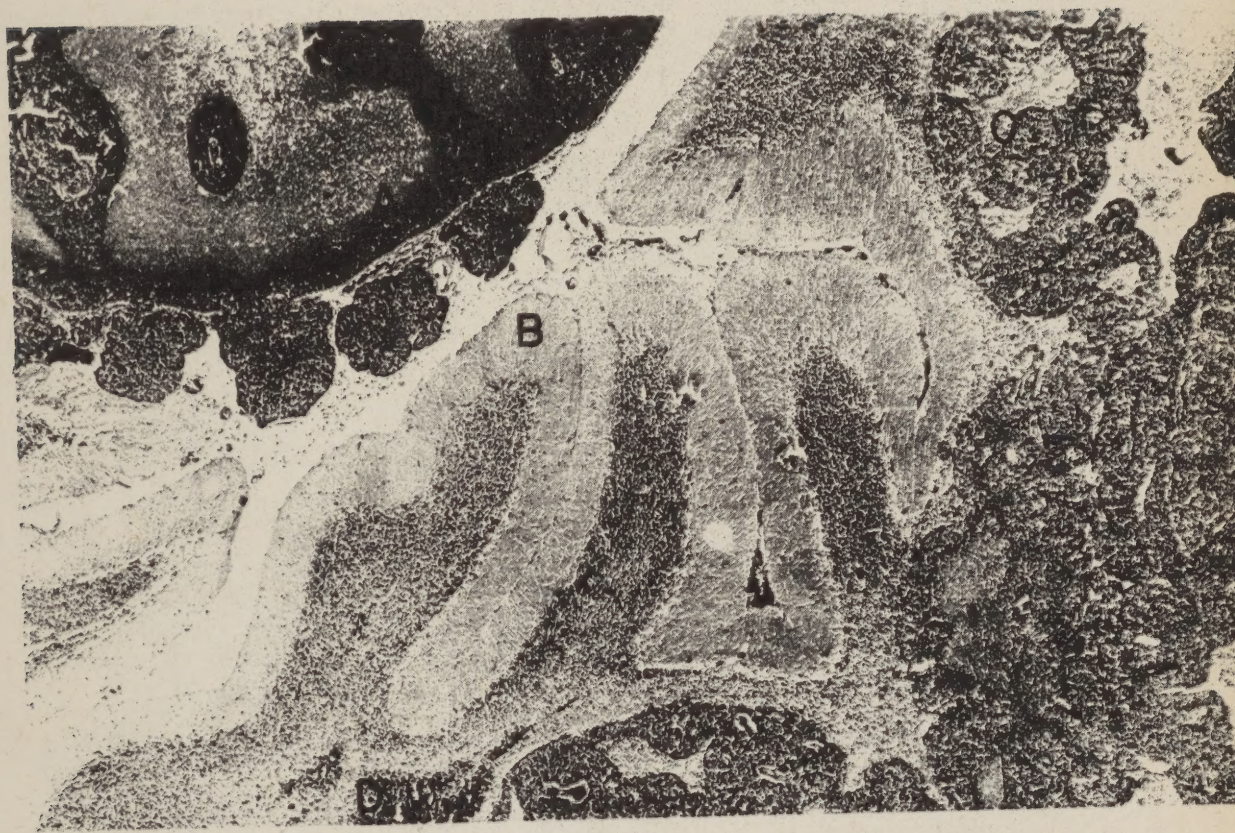
METASTATIC CARCINOMA

Clinical Note: White female, age 52. In November 1932 a simple amputation of the left breast was performed. During the operative procedure an encapsulated tumor was found and the regional lymphatics were not involved. This tumor was diagnosed adenocarcinoma. In 1936 there was an onset of severe frontal headache followed later by nausea and vomiting and signs of increased intracranial pressure. Death occurred in December 1937, five years from the time of removal of the breast tumor. Clinically, there was evidence of metastasis to lungs and brain.

Path. Gross: A sharply outlined cerebellar tumor was found. The tumor was opaque, finely granular and the size of an almond.

Microscopic: Note the sharp demarcation between the tumor (A) and cerebellar cortex (B). The lobulated architecture (C) is unlike any of the primary gliomas. The focalization about blood vessels (D) and the fact that they are multiple indicate that they are metastatic. There is little if any evidence of acinar arrangement and it would be difficult to tell that it was of breast origin. In addition to carcinoma of the breast, carcinoma of the lung and malignant melanomas are common primary sources of brain metastases.

METASTATIC CARCINOMA ACC. 56744



NEG. 72141 X36